The Excavating Engineer

PUBLISHED MONTHLY

Ten Cents Per Copy *One Dollar Per Year*

Vol. 12 **MILWAUKEE, MARCH 1916** **No. 6**

CONTENTS

FRONT COVER ILLUSTRATION

Railroad Construction in Sweden. A 40-R Bucyrus in Operation. See Page 214.

Leading Articles

Plant of the New York Trap Rock Company, Rockland Lake, N. Y. 209
County Road Work Through Rough Country in Oregon with a Revolving Shovel 211
Steam Shovel Work in Sweden 214

Miscellaneous Articles

Welsh President of International Brotherhood 210
Dipper Dredge Output at Panama 216
Donald Alexander McIntosh 216
Of Interest to Vulcan Shovel Owners and Prospective Users 216

Editorial 216

Field Notes

How to Operate a Revolving Shovel on Platforms 222
Rope Speed of Hoisting Engines 222

Photographs from the Field 220-221

Devices You Ought to Know About

Cleaning Out Old Ditches—*By F. W. Wilson* 218
An Interesting New Concrete Mixer 219

Shots From the Firing Line

Brief Notes from Men in the Field 223

Prospective Construction

Fact and Rumor Concerning New and Prospective Construction 227

Index to Advertisers, Page 240.

Trade Notes, Page 229.

Review of Books, Page 219.

ADDRESS ALL COMMUNICATIONS TO

THE EXCAVATING ENGINEER PUBLISHING COMPANY

BRADLEE VAN BRUNT, Manager and Editor

267 NATIONAL AVENUE MILWAUKEE, WIS., U. S. A.

Copyright 1916, by the Excavating Engineer Publishing Co.

Electric Shovel and Dragline Operated by Westinghouse Motors, Calumet-Sag Channel, Blue Island, Ill.

Electric Shovels Are Cheapest

In all kinds of work where electric power is available, electric shovels have proven their advantages over steam shovels. Consider what these advantages are:

Lower Operating Cost

Electric Shovels are cheaper to operate than steam shovels.

No Stand By Losses

When the shovel stops the expense stops whether for a moment, an hour or a night.

No Materials to be Supplied

No coal to be handled. No water to be brought. No water pipes to be laid. No danger from freezing on a cold night.

No Special Attendant Required

Any man who can operate a steam engine can operate the electric motors. Westinghouse motors are easier to handle than steam engines.

No Money Wasted in Unnecessary Repairs

Westinghouse motors for shovels are extremely rugged and your repair costs will be much lower than with a steam operated shovel.

More than 125 electric shovels with Westinghouse electric motors are in successful operation today. Send for D. L. 3710.

Westinghouse Electric & Manufacturing Company

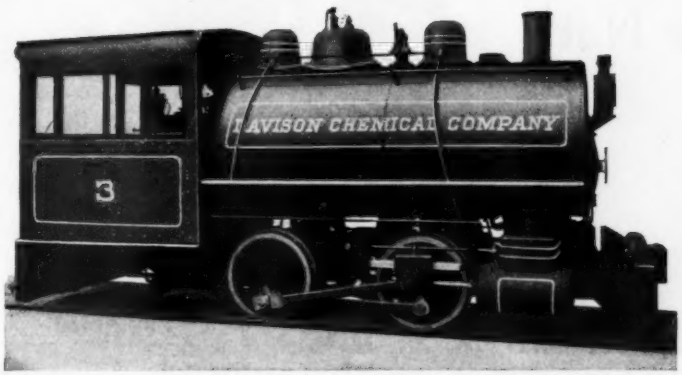
EAST PITTSBURGH, PA.

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Columbus, O.
*Dallas, Texas
Dayton, O.
Denver, Colo.
Detroit, Mich.
*El Paso, Texas
*Houston, Texas
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Seattle, Wash.
Syracuse, N. Y.
Toledo, O.
Washington, D. C.
*W. E. & M. Co., of Texas.

139

For convenience in making inquiry use postal inserted in this number.

CONTRACTORS' LOCOMOTIVES



When buying a locomotive it is important to know what you get for your money.

The designing of our locomotives is done with utmost care to insure that every part will be of correct proportion and of sufficient strength. Materials are put through severe tests.

Templates and jigs are used throughout to guarantee that each part will fit every other locomotive of the same size and design. These templates and jigs are examined regularly and frequently to be sure of their accuracy.

A visit to our Works will show you what you get for your money.

AMERICAN LOCOMOTIVE COMPANY

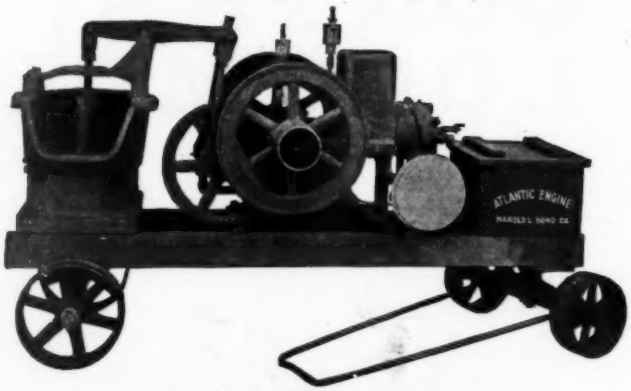
30 Church Street, New York

McCormick Building, Chicago, Illinois **A. Baldwin & Co., New Orleans, La.**
Dominion Express Building, Montreal, Canada
N. B. Livermore & Company, San Francisco and Los Angeles, California
Northwestern Equipment Company, Seattle, Wash., and Portland, Oregon

For convenience in making inquiry use postal inserted in this number.

Does Your Pump Splash?

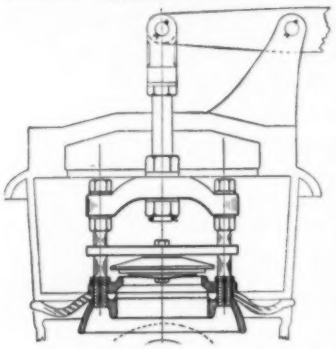
This One Does Not



New 4-Inch Atlantic Diaphragm Trench Pump

The ATLANTIC 4-inch Diaphragm Pump

has solved the former trouble of a diaphragm pump that sometimes splashed.



The New Valve that Increases the Capacity Nearly Double

This new valve prevents splashing and increases capacity from 100 to 189 gallons per minute.

Splashing was largely due to the fact that the upper valve was fixed on one side, and when the valve returned it slapped the water in such a way as to splash it over the top of the pump. A vertical valve has been designed which rises clear, allowing the water to escape on all sides. In making this improvement another thing was accomplished which is even more important—it is found that **the freedom of action in the valve increases the capacity of the pump to nearly double that of the pump with the fixed valve.** The best results from the latter pump gave 100 gallons of water a minute; the pump with the new valve, under the same conditions, gives 189 gallons of water per minute.

Telegraph or write for Net Prices and Illustrated Catalog showing the large and complete line of Atlantic Pumping Outfits for every kind of work.

HAROLD L. BOND COMPANY

383 B Atlantic Ave., BOSTON, MASS.

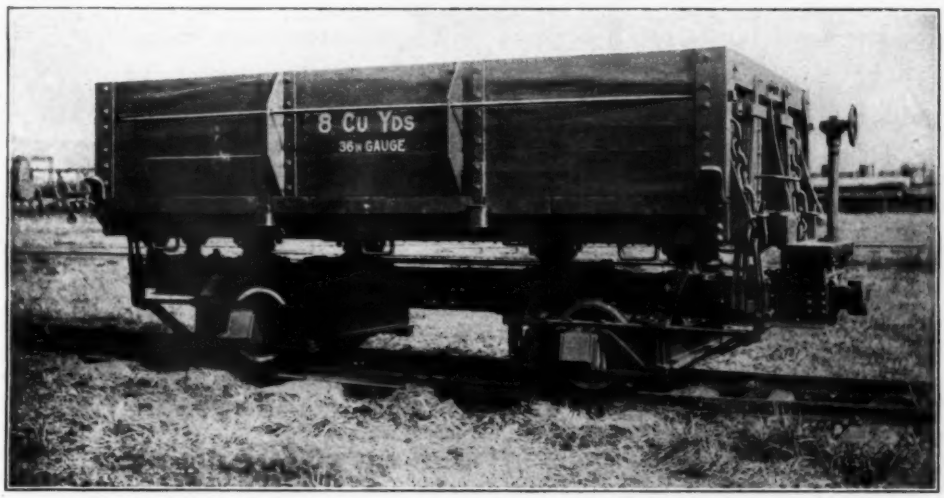
Manufacturers of

Ross Concrete Spade, Andrews' Concrete Tamper, Safety Trench Braces, Felton's Sewer and Conduit Rods, Pearl Brand Suction Hose.

A FEW OF THE IMPORTANT FEATURES OF THIS CAR

Won't Jump the Track

Improved Brakes that Really Brake
Lading 20% Over Rated Capacity
Ruggedness of Construction
Automatic Re-Righting



BELLWOOD 36-inch gauge 8 cubic yard Automatic Re-Righting Two-Way Dump Car

EFFICIENCY, STRENGTH, DURABILITY are the three essentials of a satisfactory Dump Car. That BELLWOOD CARS have never failed to give complete satisfaction proves that these three essentials are all incorporated in their manufacture.

The contractor of today cannot afford to give consideration only to the initial cost of his equipment, but must look to the ultimate amount of satisfactory service, with least repair cost, obtained therefrom. The car shown above is particularly adapted to contractors' service, having a FULL SWING CAPACIOUS DOOR OPENING; is automatic re-righting; and equipped with ARTICULATED TRUCK, which insures an equal distribution of the load on all four wheels, eliminating the annoying and profit-destroying derailments so common in stiff frame cars.

LET US HELP YOU INCREASE YOUR PROFITS

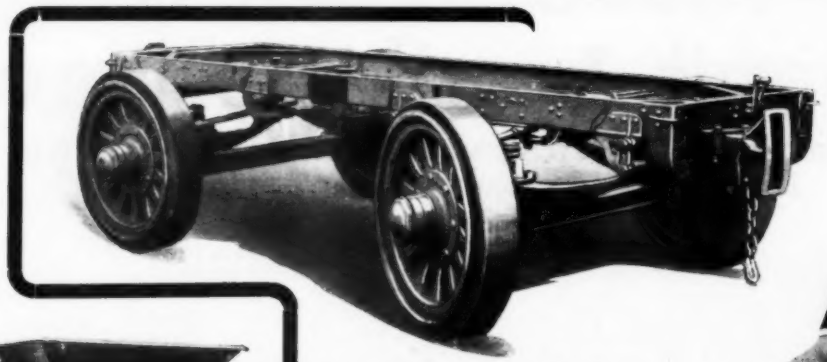
We build cars to meet all conditions of service. Tell us your troubles. We will be glad to give you the benefit of our experience in suggesting the most suitable line of equipment for your work, whatever it may be.

BELLWOOD DUMP CARS

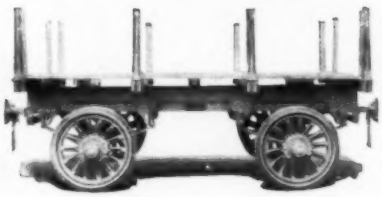
SALES OFFICE, 516 Commercial Trust Bldg.

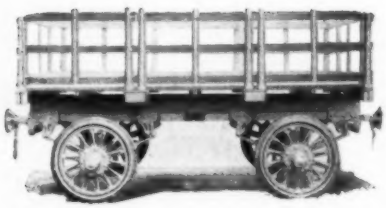
Works, BELLWOOD, PA. **PHILADELPHIA, PA.**

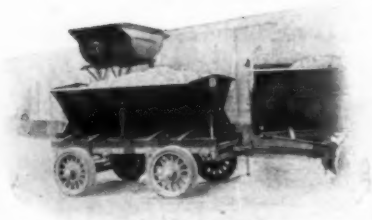
For convenience in making inquiry use postal inserted in this number.



A New Book on Trailers







It doesn't make any difference what make of truck you have—TROY Trailers are in service with practically every standard make of truck. Nor does the size of your truck matter—TROY Trailers range in capacity from 1 to 5 tons. You can get a body exactly suited to your needs.

TROY Trailers are making motor trucks pay big. If you are interested in trucks write for trailer booklet 4-EE, just off the press—whether you are a user or a dealer. It entails no obligation.

The Troy Wagon Works Co.

TROY, OHIO, U. S. A.

New York	Detroit	Washington, D. C.	London, Eng
1876 Broadway	113 First St.	505 Rigs Bldg.	49 Pall Mall

For convenience in making inquiry use postal inserted in this number.

The Albrecht Excavator and Loader

Digs—
Conveys—
Loads

for

3 Cents per Cubic Yard

The Albrecht Excavator and Loader fills the broad gap which has heretofore existed between the big, expensive steam shovel and the gang of hand shovellers. It excavates and loads from 200 to 300 yards a day. ***Two men*** do the work which formerly required 15 to 25 men. The hardest clay can be plowed, excavated and shoveled into wagons at the rate of 15 to 20 yards per hour.

For excavating cellars, basements and ditches, only one man is in the pit and one on the machine. The excavator and teams stay on the street—***two men*** handle the whole job. It loads dirt, sand, gravel, coal or crushed rock faster than 20 men with shovels can do it.

The Albrecht excavates and loads at a cost of about three cents per yard.

SEND FOR EXCAVATOR FOLDER No. 651-B

THE T. L. SMITH CO.
1177-B Thirty-Second Street
MILWAUKEE, WIS.

For convenience in making inquiry use postal inserted in this number.

The south end of the quarry showing the quarry face and floor. Small wooden cars used in the old operation may be seen to the right. The new power plant containing 760 K. V. A. Westinghouse turbo-generator and Ingersoll-Rand 250 cubic foot air compressor, and four 250 H. P. boilers may be seen on the river bank at the left.

The north end of the quarry showing one of the shovels in operation. This view gives a good idea of the general layout of the quarry and the method of bringing the cars to the foot of the incline. Loaded cars may be seen going up the incline to the crusher.

110-C Bucyrus shovel number 1, making its first cut.

Number 2 shovel is here shown making its initial cut. L. Lawrence, foreman, and V. F. Amar, superintendent, are in the foreground.

The New York Trap Rock Company's Quarry at Rockland Lake, New York

621.86
gEx2

The Excavating Engineer

Vol. 12 MARCH, 1916 No. 6

The Plant of the New York Trap Rock Company, Rockland Lake, New York

How the installation of two 110-C Bucyrus steam shovels has replaced 200 men with a dozen horses and drivers, made unnecessary the use of 1000 pounds of 60 per cent dynamite per day, and solved the noise problem.

THE quarry of the New York Trap Rock Company is situated on the west bank of the Hudson River at Rockland Lake, New York, about 28 miles north of New York City, directly opposite Ossining.

The product of the quarry is handled entirely by water. The crushed rock is loaded on to barges with a capacity of from 650 to 850 cubic yards each and towed to New York or to the Hudson River towns north as far as Albany. New York Harbor is within one day's run from the dock.

Why Steam Shovels Were Installed

The quarry was formerly operated by hand labor. About 175 switches were worked with two men loading 3½-ton cars on each switch. Under these conditions of operation, the size of stone loaded naturally had to be limited to the weight two men could easily handle. Consequently, it was necessary to shoot on an average of twelve block holes per switch, twice a day. This blasting created a noise which was the subject of much complaint.

Wilson P. Foss, president, J. H. Cooper, master mechanic and V. F. Amar, superintendent, finally came to the conclusion that the installation of powerful shovels would not only result in more economical operation, but would eliminate a great deal of the complaint caused by the above mentioned noise of the blasting. Consequently, after considerable investigation, they purchased two 110-C Bucyrus steam shovels equipped with 4½ cubic yard dippers. This is the heaviest and most powerful type of railroad shovel built and is designed particularly with the requirements of quarry service in view. The installation of these shovels resulted in the elimination of approximately 200 men and a dozen horses and drivers. It did away with the use of about 1000 pounds of 60 per cent dynamite per day, which was used in block hole blasting and mud capping in order to reduce the rock to a size which could be handled by hand, and furthermore, it resulted in the practical elimination of the above mentioned objection caused by the noise of the blasting.

The Quarry

The quarry consists of a mountain of hard, tough trap rock admirably adapted to concrete and road building purposes. This mountain stands at an angle of 10 to 12 degrees from the perpendicular, leaning slightly away from the work. At the present time this quarry is operated on three levels. The main quarry level is about 2000 feet long and the cliff averages about 450 feet in height. This level is about 75 feet above flood tide. The second level is about 250 feet above the river and the third, just above high water mark. These last two levels are being worked in preparation for the location of a new crushing plant which is to be installed within the next few years.

Shovel Operation

The two 110-C Bucyrus shovels above mentioned load into steel cars with a capacity of about 10 tons. One side of these cars is open, to facilitate in the dumping of the material. Thirty-five of these are in use. These cars are hauled to the foot of the incline in three trains of six cars each, by three 25-ton American locomotives. As our views show, the cars are hauled to the foot of the incline by the locomotives. Here they are uncoupled and delivered to the haul, one car at a time. Thence they are elevated to the mouth of the jaw crushers,

One of the two 110-C Bucyrus shovels in the bank. Attention is drawn to the height of the quarry face and the size of the rock handled by the shovel

onto a dump table operated by compressed air and returned empty by way of a gravity incline to the waiting locomotives below.

The shovels are operated lengthwise of the quarry, working single shifts of ten hours each. The present output of both shovels is about 2500 cubic yards per shift which does not, however, represent their capacity. They have shown a capacity of from 2000 to 2500 cubic yards each.

The drilling in the quarry is done with Mc Kiernan No. 3⅝ tripod drills, air operated. The drills are drilled to a depth of 24 feet and are sprung and shot with black powder. The rock is seamy and runs in benches. The blasting is under the supervision of Luke Lawrence, the chief blaster and quarry foreman.

Crusher and Power House Equipment

The equipment for crushing the stone consists of one 66-inch by 86-inch jaw crusher built by the Traylor Engineering Company of Allentown, Pa. This is said to be the largest jaw crusher in the world, and has a capacity of about 5000 cubic yards per ten-hour day. In addition to this, there are two No. 8 gyratory crushers, nine No. 6 gyratory crushers and one set of recrushing rolls. The power for operating this plant is derived from one 600 H. P. Corliss engine, one low pressure turbine of about 600 H. P. capacity which is run on the exhaust from the above mentioned Corliss engine and one high pressure turbine rated at about 1200 H. P. The compressed air is delivered at 80 pounds pressure to the drill sharpeners, dump table, etc. by an Ingersoll-Rand 2500 cubic foot compressor. In addition to this, the plant is equipped with eight 300 H. P., five-tube boilers.

The operation of the plant is under the supervision of V. F. Amar, superintendent. J. H. Cooper is master mechanic and L. Lawrence, blaster and quarry foreman. Shovel No. 1 is operated by E. Colbath and H. Dey and No. 2, by N. Tossing and Wm Tuceling We are indebted to Mr. Amar for the above information.

Welsh President of International Brotherhood

Mr. W. M. Welsh of New York was elected General President of the International Brotherhood of Steam Shovel and Dredgemen in the election held at Chicago Illinois, January 22nd. This is the first election held by the Shovelmen since the amalgamation of the Associated Union of Steam Shovelmen and International Brotherhood which was consumated a year ago under the direction of Mr. Samuel Gompers of the American Federation of Labor.

Mr. Welsh has been identified with the Union Shovelmen since 1894 having served three terms as a director and two terms as Secretary-Treasurer of Pittsburg Local No. 3, was also elected twice to the Vice-Presidency of the Grand Lodge at Chicago and served two terms as Secretary-Treasurer of New York Local No. 6 of the Associated Union of Steam Shovel and Dredgemen.

At the time of the amalgamation of the two organizations Mr. Welsh was appointed to the office of District Representative of District No. 2 which includes the New England and Middle Atlantic States, Virginia, West Virginia and part of Ohio.

Mr. Welsh is a native of Washington County, Ohio he first realized what pay-day meant after he had fired a Steam Shovel for a month on the construction of the Kenawha Valley R. R. in 1889 having since been employed by some of the largest and most successful construction firms in the country, filling all positions on steam shovels consecutively.

The headquarters of the International Brotherhood of Steam Shovel and Dredgemen is located in the Fort Dearborn Building Chicago, Illinois.

County Road Work Through Rough Country in Oregon with a Revolving Shovel

The contractors make good profit at $.60 per cubic yard with a 5/8-yard revolving shovel on a job which would have cost $1.60 per cubic yard by hand and team method. Difficult work through rough country in Klamath County, Oregon. Chapman Construction Company of Klamath Falls, contractors.

THE piece of work which we describe herewith is a portion of the great project for building a 1,000-mile highway from San Francisco to Portland, Oregon. This project is well under way at the present time, the various counties through which the road passes in both states doing the work.

Klamath County, which is in the extreme south of Oregon next to the California border, has in the past two years graded in the neighborhood of 83 miles, a part of which has been surfaced with cinders and gravel. This county has until recently been rather devoid of roads and its very rich lands have not had sufficient access to the larger towns to permit of their rapid development. This highway will serve two main purposes. The northern part of the county which is a rich farm, dairy and stock raising district, will be put into close communication with Klamath Falls, the county seat. Secondly, the highway will afford one of the most beautiful scenic roads on the Pacific Coast. It runs through the wonderful lava bed country of northern Califor-

A blast on Chapman Construction Company's work, Klamath County road work. 45 holes drilled. The air for the drills is compressed behind the shovel and piped to the drills.

nia and southern Oregon where the famous Modock Indian war was fought. This country has been made famous by great caves, one of which is over 300 to 400 feet wide and a mile and a quarter long. Another contains ice the year through, and still another, hot springs, hot enough in fact to serve for the purpose of cooking meals. On leaving the lava bed country, the road runs into Klamath Valley which consists of 157,000 acres of rich land, 80,000 of which is at present under irrigation. This valley is about 40 miles long and extends from the lava beds to Klamath Falls, which is at the foot of Klamath Lake.

After the blast. How the 14-B Bucyrus handled the big boulders. This view gives a good idea of the rough character of the country and the heavy digging encountered. The contractors made a profit on this.

What the Contract Called For

At this point, the Chapman Construction Company's contract started. Their contract with the county called for the excavation of 77,635 cubic yards of material, 21,000 of which was earth and the balance all varieties of rock, cinders and other heavy material. Leaving Klamath Falls, the road which they have built runs north, skirting the shores of Klamath Lake and running over Rattlesnake Point upon a grade of 3 per cent, the highest point being 495 feet above the lake. The view here is remarkable. The whole of upper Klamath Lake which is 6 miles wide and 38 miles long with the snow capped peaks of Mt. Shasta, Mt. Pitt, the Three Sisters and many others, may be seen. From here the road decends on the same grade into Wood River Valley, crosses Williamson River and Spring Creek, thence through Crater National Park by Crater Lake to the northern line of Klamath County.

The Character of the Material Handled— The Output of the Shovel

The material handled by the shovel, which was a 14-B Bucyrus with a $\frac{5}{8}$-yard dipper, was extremely

heavy. In fact it was more suitable to a much heavier machine, but the rough character of the country made it essential to use as light a shovel as possible. There was only a short stretch of road which did not contain rock. Sand was first encountered. This soon ran into doby and then to chalk rock and cinders. In this class of material the shovel averaged 480 cubic yards a day. From this class of material they ran into cemented gravel containing boulders of all sizes, some being so large around the shovel. Two 8-hour shifts were worked, but at times when the material was all overcast on one side as shown in one of our photographs, they worked three 8-hour shifts. The entire contract was a question of overcasting.

The Pumping Plant

The first thing the contractors did after moving the shovel on the job was to install a pumping plant close by the lake. The water was pumped by a

Casting-over on Klamath County road work, Klamath Lake below. Wood for fuel piled in foreground. 14-B, Bucyrus shovel in action.

that it was necessary to blast before handling. The greater part of them, however, were handled with a chain as shown in one of our views. Loose rock or rock slides on the sides of the mountain were then encountered. Underneath these rock slides there was either solid rock or cemented gravel and cinders all of which had to be blasted. The photographs give a good conception of what the shovel was up against. In this work the cuts ran from 5 to 7½ cubic yards per lineal foot and the shovel averaged about 70 lineal feet of road per day with four men, an engineer, a fireman, a pitman and a wood-passer, 4 inch duplex pump driven by a 6 H. P. Fairbanks-Morse engine placed 13 feet above the lake level. The suction line was 2½ inches. From here the water was delivered through 620 feet of 2-inch pipe, to a tank 275 feet above the lake. From this tank the water was piped down the hill to the shovel through a ¾-inch pipe line. There was always sufficient pressure to put the water into the steam shovel tank.

Air Compressor Plant

In order to handle the rock, the contractors installed a 10 H. P. Sullivan air compressor driven

by a 6 H. P. Fairbanks-Morse oil engine. This plant delivered the air to the rock drills which were of the Sullivan Machinery Company's and the Denver Rock Drill Company's manufacture. This plant was mounted on skids back of the shovel and the air was piped ahead. The plant was moved for every 1,000 lineal feet advance of the shovel.

The Fuel Used

Wood was used for fuel, the shovel burning 1½ cords per 8-hour shift. This wood was delivered in 4-foot lengths and cost $3.25 per cord delivered. It was necessary, however, to cut this in small sizes with a 4 H. P. Fairbanks-Morse gasoline wood saw. The cost of the wood on the shovel properly cut was $5.50 per cord. This high cost could not be overcome as the shovel was working in a very out of the way place.

The Saving Effected by Shovel Operation

The Chapman Construction Company were the only steam shovel contractors who bid on this piece of work. Their price was $.60 per cubic yard straight. To afford an idea of the value of a revolving steam shovel for this class of work, it is interesting to observe that the next lowest bid, which of course was by hand and team method, was $.38 for earth, $.90 loose rock, $1.84 solid rock and $1.32 for cemented gravel. The contractors state that had this been done by hand and team method, it would have cost $1.60 per cubic yard straight through. When it was understood that they were to use a steam shovel it was predicted that they would fail. As a matter of fact, the work is now completed at a nice profit, and the contractors state furthermore that they would use no other method or type of shovel had they the job to do over again.

The work was under the supervision of N. J. Chapman, president and treasurer, and A. F. Graham, vice-president and secretary. We are indebted to the latter for the above information.

Steam Shovel Work in Sweden

An interesting example of the introduction of American steam shovels in Sweden for railroad construction.

ON May 1st, 1914, construction work was started on the Riddarhyttan-Lerklockan-Persgrufvan-Backgrufvan Railway, which is a new outlet from three iron mines situated in about the center of Sweden, to the terminal station, Riddarhyttan. This work is particularly interesting as it is another example of the successful introduction of American steam shovels for railroad construction in Europe.

The three iron mines above mentioned are known as Lerklockan, Persgrifvan and Backegrufvan. As stated, they are situated in about the center of Sweden. The work called for the construction of a new outlet from these three mines and also extensions and improvements of the track system at Riddarhyttan, aggregating a total length of track of 7 km or about 4½ miles. 60,000 cubic meters or about 78,000 cubic yards has been handled.

The material handled was unusually hard. It consisted of 30,000 cubic meters (39,000 cubic yards) of gravel and 30,000 cubic meters mainly of cemented gravel, clay and large boulders which is the hardest digging encountered in this country. The road runs for the most part through wooded country.

The contract was awarded to Anders Bentz who used a 40-R Bucyrus steam shovel equipped with a 1½ cubic yard dipper. With this shovel he used flat cars with dropped sides having a capacity of 5 cubic meters each, or about 6½ cubic yards. Ten of these were used in a train. The gauge of the track was the same as that of the railroad, namely, 1.093 meters. Since the shovel started, there has been no delay from this source whatsoever and the repairs considering the hard digging, have been exceedingly light. According to Mr. Bentz, in loading gravel, the shovel can easily take three dippers a minute. This gravel was used for the balasting of the road bed and for filling out the banks. The average length of haul was 3 km. Mr. Bentz advises that the ability of the shovel to dig hard material is astonishing. If a sufficient number of cars could have been obtained, it could easily load 1000 to 1200 cubic meters (1300 to 1500 cubic yards) in ten hours.

The shovel of course was operated as usual by three men, an engineer, a cranesman and a fireman. Four men were used in the pit to handle the track sections and clean up around the shovel.

There were several interesting problems encountered in connection with this work. It was originally intended to drill and blast the boulders by means of an air compressor, but the compressor

Construction work under way on the Riddarhyttan-Lerklockan-Persgrufvan-Backgrufvan Railway in Sweden. 40-R Bucyrus shovel in operation. The shovel is shown just starting a new cut. The work is for the most part through wooded country and very heavy digging has been encountered. A temporary water tank for the supply of the locomotives and steam shovel may be seen in the background.

which had been ordered from the United States was delayed so long by the British blockade that it did not arrive until after the contract was completed, Consequently, the big boulders which were encountered had to be handled entirely by the shovel. This of course cut down the output considerably as it was often necessary to dig around these boulders before they could be extracted. Mr. Bentz states that he has found the shovel in the highest degree economical for this work.

The shovel was operated by K. E. Jonsson as engineer and P. Andersson as cranesman.

The Song of the Dragline Man

By L. J. Tibbs, Cape Girardeau, Mo.

They call me a dragline mechanic,
  And I run a Bucyrus machine.
I never go up in a panic,
  And never get wrong in the "bean."
The contractor says, she is a dandy,
  The engineer says, she's the candy,
The modern Bucyrus machine.

I've worked all over the Southland,
  I've worked in Canada too,
I've tried it in Swamp East Missouri,
  Of jobs, I've had quite a few,
I've traveled from ocean to ocean,
  Its equal I never have seen,
There is no other one to my notion,
  That can beat the Bucyrus machine.

She's an honest old piece of machin'ry,
  Her owner she never will rob,
In all kinds of digging or weather,
  You'll find her right there on the job,
She's the greatest thing ever invented,
  Of draglines she sure is the Queen,
I'm happy and sweetly contented,
  I run a Bucyrus machine.

I once was a grouchy old sorehead,
  With monkey wrench, crowbar and sledge,
I used to work 'til I was half dead,
  Repairing some shaky old dredge,
But I no longer swear like a trooper,
  For life is so sweet and serene,
I wouldn't trade jobs with the "super,"
  I run a Bucyrus machine.

The Allies may hammer the German,
  The Russian may gobble the Turk,
I don't care a lemon who conquers,
  If they don't interfere with my work,
So I'll send for the wife and the kiddies,
  And anchor right here on the scene,
I'll stay 'till the contract is finished,
  I run a Bucyrus machine.

The Excavating Engineer

A Monthly Publication Devoted to Excavating *and* Allied Subjects

Subscriptions, payable in advance, $1.00 a year for 12 numbers, 50 cents for six months.

To foreign countries, including postage, $1.00 or its equivalent, 4 shillings; 4 marks; or 5 francs.

Notice to discontinue should be written to the Milwaukee Office in every instance.

Advertising copy should reach Milwaukee Office by 10th of month before date of issue.

Address all communications to the company.

THE EXCAVATING ENGINEER PUBLISHING CO.

Bradlee Van Brunt, Manager and Editor

267 National Avenue Milwaukee, Wis., U. S. A.

Construction Outlook

The general business situation still continues to improve. The rapid rise in stocks which has been so marked for the past few months, experienced somewhat of a check recently, due partially to the fact that undue speculation had reached its limit. Conditions now seem to be on a more normal basis.

We still hear no news of big railroad work, although there are many rumors of small betterment jobs current. We confidently look for a good season next year, as the railroad investment market is better than it has been for sometime, railroad earnings are showing a remarkable improvement and the need for new lines is very apparent.

In spite of the rumored railroad strike, a strong undertone of confidence exists.

Changes in Bucyrus Sales Organization

Effective February 11th, 1916, Mr. S. E. Elmore, formerly Central Sales Manager of the Bucyrus Company, became Superintendent of the Evansville plant of this company. Mr. E. C. Hingston is now in Chicago as Central Sales Manager and Mr. G. H. Hutchinson is Western Sales Manager, having his office at 806 Merchants National Bank Bldg., San Francisco. Mr. Hutchinson will cover California, Nevada, Utah and Arizona. Mr. L. T. Russell, as Northwestern Sales Manager, will continue his office at 608 Pittock Block, Portland, handlIng business in Washington, Oregon, Idaho and Western Montana.

Of Interest to Vulcan Shovel Owners and Prospective Users

The Federal Court of the Northern District of Ohio has granted a perpetual injunction against the Duncan Company, the Vulcan Iron Works Company and Frank A. Duncan, restraining them from using the trade names "Vulcan," "Vulcan Iron Works Company," "Giant," "Little Giant," "Baby Giant," or from using any modified form or other form in its advertising circulars and catalogues, reproductions or immitations of the halftones and photographs of the Vulcan Steam Shovel Company's and Bucyrus Company's Vulcan, Giant, Little Giant and other shovels. The Vulcan Iron Works Company having represented that it is about to pay all its debts and liabilities, is ordered to proceed within ninety days, to surrender its corporate authority and to bring about its disolution under the laws of Ohio.

This should be of special interest to Vulcan shovel owners as the Bucyrus Company are the sole possessors of the original records, patterns, drawings, etc. of Vulcan steam shovels, and are therefore, the only company who are able to supply repair parts accurately and correctly.

Dipper Dredge Output at Panama

The output for the 15-yard Bucyrus dipper dredges, Cascadas, Gamboa and Paraiso for the months of December and January, are given below. As may be observed, the January outputs are somewhat lower than December. This is due to the fact that they are running into harder material. At the present writing they are digging in more or less hard rock at the base of Gold Hill.

December	Cascadas	321,065	cubic yards
"	Gamboa	266,470	"
"	Paraiso	312,920	"
January	Cascadas	292,675	"
"	Gamboa	232,855	"
"	Paraiso	195,515	"

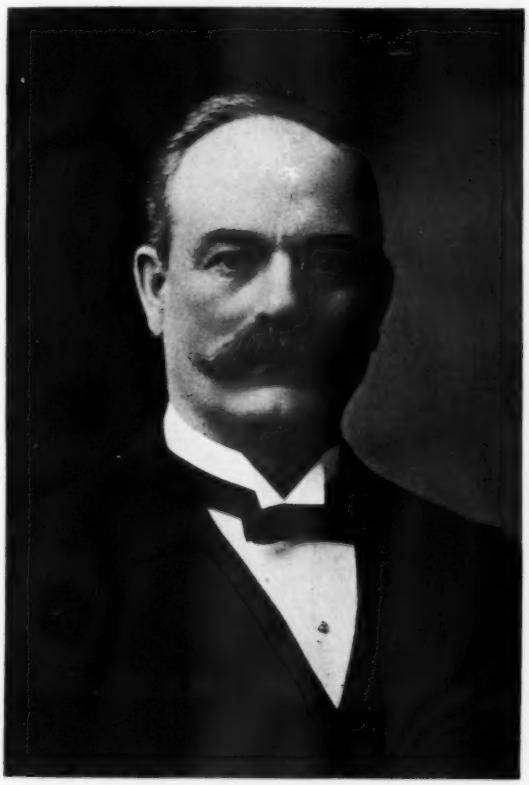
Donald Alexander McIntosh

Donald A. McIntosh, one of the most prominent railroad contractors in this country, died in Los Angeles on December 18th. We published a short notice of his death in our last number. His name is so well known to contractors and shovel men far and wide, that it is hardly necessary for us to tell our readers who he is. We hope and believe that there are other men among us with the splendid virility and fighting spirit of Mr. McIntosh, for our country needs such to-day. But sometimes it is necessary for such a spirit to leave us in order that its true worth be fully crystalized. The worth of such a spirit is a difficult thing to paint in words. We feel, however, that we can do no better than to quote in full, the inspiring funeral address delivered by Rev.

James Oastler, D. D. at Forest Home Chapel, Milwaukee, on December 23rd, 1915.

"'*A Workman that needeth not be ashamed.*'
—*II. Timothy 2:15.*

Ralph Connor has a book entitled, 'The Man from Glengarry.' It is dedicated 'To the Men ofGlengarry, who in patience, in courage and in the fear of God are helping to build the Empire of the Canadian West.' In his preface he goes on to say that these men are worth remembering. 'They carried the marks of their blood in their courage, their loyalty, their



Donald Alexander McIntosh

patience, their resourcefulness, their self-reliance. But deeper than all, the mark that reached down to their heart's core was that of their faith, for in them dwelt the fear of God.' These Glengarry men are sons of the men who had come from the highlands and islands of Scotland in the earlier days—and mighty men they were—pioneers—builders of empires. Their manner of life bred in them hardiness of frame, alertness of sense, readiness of resource and a courage that grew with peril. Fighting was like wine to them, when the fight was worth while.

We, of the United States, can congratulate ourselves that some of the Glengarry men found their way across the border, and brought with them their courage, their resourcefulness and their love of the open. They did not ask for an opening. They asked this question: 'What does the world need to have done?' Then they set about doing it. Donald A. McIntosh was a man from Glengarry.

Big men, capable of big accomplishment, get a big hold on our affections. The separation that death effects is therefore unspeakably sad, but it will be a never-failing source of joy to remember that a worthy work was done, which has enriched the common life of humanity, and that he was a credit to his high lineage and to the splendid traditions of his race.

Fichte in 'Man's Vocation' says: 'Not merely to know, but according to thy knowledge to do, is thy vocation, not for idle contemplation of thyself; not for nursing devout sensations; for **action** art thou here; and thine action alone determines thy worth." I believe that the beneficence of the world order in which we live is nowhere more effectively displayed than in the number of things it offers us to do. Bodies and brains and magnificent things to do!

The pleasure we get out of our work has three elements in it. First, the pleasure that comes from the mere exercise of our powers, and that is a real pleasure. If a man can do a thing—especially if he can do it well, then there is genuine joy in the doing of it. When one can write novels like Dickens or George Eliot—when one can write poetry like Milton or Tennyson—when one can compose music like Mozart—when one can preach the Gospel like Beecher—when one can conceive and construct locomotives like George Stephenson—when one can build railways like Donald McIntosh, then there is real zest and real joy in the mere doing of it. That is the first element of pleasure that we get out of our work.

The second element of joy in our work is the results that we see. The amount of effect that has been produced in the world by man's work has been simply tremendous—the face of nature enormously altered and the condition of humanity enormously improved. Sometimes we feel how little men have done in the world or for it, but oftener we feel and we are impressed with **how much** they have done.

How great is the joy of having had part in the beneficient work of the world! How great is the joy of knowing as Donald McIntosh knew that he was one of the units in the constructive co-operative enterprise!

The third element in the joy of our work is the way our work developes us and makes us acquainted with ourselves. Work is a great revealer. A man who has worked 30 years can talk to you in an

interesting way. He is no longer a mere theorist. There have been revealed to him valuable things about himself, about other men, about the world, about God, which could not have been discovered otherwise. And he feels it was all worth while. He had pleasure in it.

Here is something that should be impressed upon us today, that the two kingdoms of matter and spirit interesect at every point, and a man cannot do good honest work in the one kingdom without making important contributions to the other. There are people born with the prophetic instinct. From childhood they dream dreams and see visions. They have a sense for the unseen as distinct and special as had Newton for mathematics. Their nature inwardly and instinctively thrills to everything relating to the mystic, the supersenuous. We are inclined to think of such characters as especially beloved of Heaven. Let us make no mistake. As a matter of fact, if the world were peopled exclusively with this type, civilization would stand still. The seer's neighbor, who is nothing, if not practical, who is designing bridges or inventing locomotives, or making a highway for commerce over the desert; this man is the seer's necessary counterpart, **and the world could not get on without him.** To put one of these up and the other down in the scale of moral worth, is a blunder which the world in times past has made too often. We each have our work to do, and if we do it, we win the Divine approval.

I very distinctly recall a half hour visit with Mr. McIntosh—it was the only time I ever saw him and the only visit I ever had. But those few moments served to convince me that there was within him a superb nature, a fine generosity—that physically and mentally he was afraid of no man.

It is not my purpose to eulogize to-day even though he is worthy of it—simply to say of him—than which no greater thing can be said of any man—that he did his work for the world and he did it well—and he leaves in the hearts of those who knew him and survive him a blessed memory.

He is beyond the tumult and worry of the world—he sleeps now in beautiful Forest Home Cemetery, our Milwaukee place of burial, whither on the Thursday after he died his remains were conducted with all the honorable circumstance and ceremony which the living can pay to the dead.

'Well done, good and faithful servant, enter thou into the joy of the Lord'."

DEVICES YOU OUGHT TO KNOW ABOUT

Cleaning Out Old Ditches

By F. W. Wilson

The Cache La Powdre Reservoir Company of Colorado have an open ditch three miles long. As unprotected ditches are likely to do, this one gradually filled with sediment, also sand and rubbish of various kinds blown into it by the winds.

The banks made it impossible to clean it out with teams. The Company officials were in a quandary, for they had visions of months of costly work shoveling from the bottom on to a scaffold and from the scaffold over on the bank.

About that time, a young contractor named Marsh happened along and made the Company a proposition to blast the ditch down to its former grade with dynamite.

It was a new idea to the officials; they hadn't much faith in it simply because it was a method with which they were not familiar. However, with them it was a case of desperate cases requiring desperate remedies and they told him to go ahead.

At the time of writing, Mr. Marsh had finished three quarters of a mile of the ditch to the entire satisfaction of those employing him. Furthermore, he was securing a better grade than the engineers demanded.

Mr. Marsh estimates that at least 15,000 pounds of Straight 50 or 60 per cent dynamite will be needed to complete the job.

Work of this kind can be done in two different ways. There is what is known as the "propagated" method and the electric.

The former is practicable only when the soil to be lifted out is dense and saturated. By using a "straight" dynamite and placing the charges from 15 to 28 inches apart (spacing depending on the soil and depth) a long line of holes can be fired simultaneously, the charges carrying or running down the line both ways from the center—the center hole having been charged with a primer cartridge.

The electric method must be employed when the soil is dry or light. Every hole in the line must be

charged with a primer cartridge, the cap wires being connected up to a blasting machine circuit in series. Of course, the use of these electric blasting caps makes this method somewhat more expensive than the other, but the cost of caps is partly offset by the fact that a cheaper grade of dynamite can be employed and the holes can be spaced somewhat farther apart.

Contractors are using dynamite for ditching more and more eash year as they become familiar with the method.

An Interesting New Concrete Mixer

Considerable attention has been attracted at the Cement Show by the appearance of a new and interesting mixer exhibited by the T. L. Smith Company of Milwaukee. This mixer is known as their No. 507 High Drum Smith-Chicago Paver. It is equipped with a 14-inch swivel chute and is operated by steam.

This mixer is distinguished by a number of interesting features which we will merely mention here as a complete and clear description may be obtained by sending for literature issued by this company.

Of the points which stand out prominently. The one which will doubtless assume the most prominence is a device whereby an accurate figure of the amount of water used for each batch may be obtained, by weighing it instead of measuring it as has been the practice in the past. This is said to be a very simple and effective device. Its operation is automatic.

Another important feature is the long steep-angled chute, pitched at 200°, so that even the stiffest concrete used in road work will easily slide down it. This chute is equipped with four intermediate discharge openings and an auxiliary swivel chute so that the concrete will not have to drop to the ground. This gives a wide area of operation over which the concrete may be placed without moving the machine. The loading skip is wide enough so that two or three barrows can be emptied into it at once.

New Smith-Chicago High Drum Paver

REVIEW OF BOOKS and CATALOGS

We shall be glad to review in this column such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the prices named.

THE SULLIVAN "ROTATOR" HAMMER DRILLS—Bulletin No. 70-A. 6 x 9, 28 pages, describing two classes of hammer drills "DP-33" and DR-33" together with their mountings and the equipment employed with them. The former is suitable for the general run of rock drilling service and the latter for formations too soft or too broken to be handled successfully by the standard drill. Thoroughly illustrated.

Sullivan Machinery Company,
Chicago, Ill.

EVINRUDE MOTORS FOR 1916—6 x 9, 30 pages and cover. A well illustrated catalogue showing the many uses to which an Evinrude motor may be put, both for pleasure and for service. A few pages are devoted to commercial uses, showing how an Evinrude can be quickly and easily attached to a scow as flat boat or can be used for driving tools. A special Evinrude unit centrifugal pump attachment is described. The construction of the motor is fully described and illustrated.

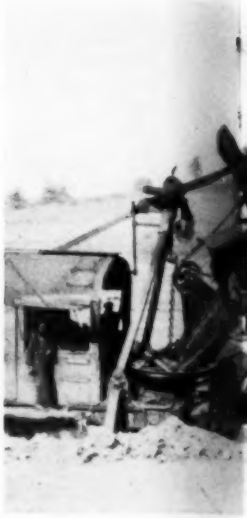
Evinrude Motor Company,
Evinrude Block, Milwaukee, Wis.

TROY TRAILERS—6 x 8½, 16 pages and cover. Trailer Booklet No. 3. A profusely illustrated booklet describing various sizes of Troy Trailers for various purposes. Specifications.

Troy Wagon Works Co.,
Troy, Miami Co., Ohio.

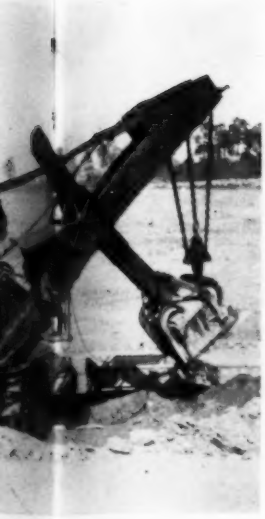
VITRIFIED BRICK PAVEMENTS FOR COUNTRY ROADS—Bulletin No. 246, U. S. Dept. of Agriculture, by V. M. Pierce, Ch. of Construction and Chas. H. Moorefield, Senior, Highway Engineer. Pamphlet 6 x 9, 40 pages. This bulletin contains a large number of splendid illustrations and sketches. The raw materials, the manufacture, the physical characteristics, construction, and the cost and maintenance of brick pavements are dealt with in detail. This publication may be procured for 8.10 per copy, from the superintendent of Documents, Government Printing Office, Washington, D. C.

A 35-B Bucyrus revolving shovel mounted on caterpillars assisting in the assembly of the 225-B Bucyrus revolving shovel at the Modern Coal Mining Company's plant, Parlette, Ohio. The photograph shows the shovel swinging one of the big wings of the revolving frame into place. The heaviest piece which it lifted was the boiler which weighed about 18 tons. The small shovel is now being used to load coal behind the big stripping shovel.



Shallow flowage excavation at Silver
shovel is increasing the capacity of a re
The material excavated is being used
down-stream sides. The shovel, a "
Parkinson, craned by Robert Kirk
Beaver Engineering & Contracting Co

What Patton & Lapsley were up against on their 100,000 yard job for the Charleston Interurban Street Rai
They used a 70-C Bucyrus shovel for the excavation.



n at Silver Lake, Staten Island, N. Y. The city of a reservoir by cutting back the banks, being used to build earthern dams on the novel, a 7-C Bucyrus, is operated by John ert Kirk and fired by John Burpo. The racting Company are the contractors.

R. H. and G. A. McWilliams' class-9½ 1½-yard Bucyrus dragline excavator mounted on caterpillars, straightening a drainage ditch on Lewis M. Swift's farm near Lake Forest, Ill. The ditch was two miles long, bottom width 4½ feet with a slope of 1½ to 1, calling for the excavation of 35,000 cubic yards. Work was started on October 17th and finished about November 10th. In order to reach the work it was necessary to move the machine under its own power over three miles of road. This was done in 11½ hours. C. B. McKnight was superintendent.

reet Railway from Winifrede Junction to Cabin Creek Junction, W. Va. Much of this was heavy work as shown. cavation. The contract was finished about Christmas time.

· FIELD NOTES ·

QUESTIONS pertaining to the operation, maintenance or repair of excavating machinery will be answered through this column. Address, Field Note Department, Excavating Engineer, P. O. Box 607, Milwaukee, Wisconsin.

How to Operate a Revolving Shovel on Platforms

We have frequently been asked as to the proper method of operating a revolving shovel on platforms. Every steam shovel engineer has his own method of operation, but we give below the method employed by a shovel man of long experience in revolving shovel work, and we believe that in the long run it will be found to be the safest and most successful method.

Four platforms are necessary. On a ⅝ or ¾ yard shovel these platforms should be about 3½ feet wide by about 11 or 12 feet long. On a ⅞ yard shovel on the other hand, they should be 4 feet wide by at least 12 feet long. We will not go into a description here of how these platforms should be constructed as that is another matter, but they should be built of heavy timbers strongly reinforced with iron bars and should have ring bolts at about the center of each end.

When working straight ahead, it will be seen that the front wheels of the shovel will rest on the first platform and the rear wheels on the third. When it is necessary to move ahead, the dipper is swung to the rear, a chain hooked on to the ring bolts of the rear platform which is now free, and the chain slung over the dipper teeth. This platform can then be easily swung around by the shovel and placed in position in front. Sometimes it is necessary in order to have it squarely meet the platform on which the front wheels are resting, to pull it back in place with the latch plate of the dipper. The shovel can then be moved on to the new platform. When in operation of course the wheels should be carefully chocked so as to prevent moving.

If it is necessary to dig a cut a little further to the right or to the left, the proper method after placing the rear platform in the front, is to move it a foot or so, we will say, to the right, in the direction in which it is necessary to move. The shovel can then be moved in a diagonal line over the corner of the first platform on to the new one. Care should be taken, however, that the right-hand wheel clears the ring bolts on the new platform. It will be seen from this that it is well to have the platform as wide as possible so as to effect a turn such as this. When the front wheels are on the new platform which will now be called the first, the second platform or the one off which the front wheels have just moved, is free and may be pulled a foot or so to the right in line with the first platform.

If it is necessary to make a right angle turn, we will say to the right, there are several methods of operation. The method most frequently employed is to make a gradual turn in the manner above described. This is perfectly safe and the runner runs no danger of straining the machine in any way. It is, however, considerably longer than other methods.

Still another method is to slew the wheels by resting on the dipper and lifting the machine by means of the thrusting engines. This, however, is rather dangerous as an operator is likely to strain the dipper handle and also to jack up the boom unnecessarily.

The quickest and best method requires a little additional equipment, but the possession of such equipment would save a good deal of time for the contractor. This equipment would be four jacks, four horses strongly constructed and high enough to give clearance of about a foot underneath the frame of the shovel and also some pieces of 10 by 10 timber and some blocking. In order to turn the shovel in this manner, these horses are put under the four corners of the frame of the shovel, care being taken to allow plenty of clearance for the wheels to turn. The shovel may then be raised sufficiently to lift the wheels off the ground and the trucks may be turned quickly in the proper direction. Before raising the shovel, of course it would be necessary to dig to grade line as far as possible in the direction in which it is desired to make the cut, and the fourth platform dropped in place here in the new direction at right angles to the other platforms. This extra equipment may cost a little money, but it will undoubtedly prove a saving to the contractor in the long run. We may say furthermore, that this last mentioned method is a wise one to employ as the contractor runs no danger of straining the machine unduly.

Rope Speed of Hoisting Engines

To find the rope or load speed of a hoisting engine:—Multiply the revolutions of crank shaft per minute by the number of teeth in pinion and divide the result by the number of teeth in drum gear. This gives the drum shaft speed. Multiply drum shaft speed by circumference of drum body to obtain rope speed.

Leschen's Hercules.

SHOTS FROM THE · FIRING LINE ·

Arizona

Hayden—A. L. Bunn is operating a Bucyrus class-7 electrically operated dragline excavator mounted on caterpillars for the Ray-Consolidated Company, here. Mr. Bunn states that he is averaging about 500 yards a day with a one-yard bucket.

Arkansas

Ashdown—J. D. and L. M. Perry, railroad contractors, have recently completed 17½ miles of good roads, here, the first ever built by this method in the state.

California

Tracy—Arthur W. Ladd is craning a 95-ton Bucyrus shovel on the Southern Pacific at the Eliot gravel pit. He advised us that the Southern Pacific have four 95, 5-yard Bucyrus shovels and two 4-yard, 85-ton Bucyrus shovels and that they are all being kept busy at the present time.

San Francisco—The board of supervisors has appropriated money for the construction of the Hetch-Hetchy Railroad. Work will be commenced at once. F. Rolandi, 660 Montgomery street, has the contract.

Modesto—Plans have been approved by which the Contra Costa Construction Co., 2323 Shattuck avenue, Berkeley, will co-operate with Peart Bros. to complete dam No. 1 of the Dallas reservoir of the Modesto irrigation district. Contract for this work was awarded to Peart Bros., on November 5th for $72,800.

Bakersfield—Contract for construction of section 2 of Bakersfield-Taft road has been awarded to W. E. Green, Tulare, for $50,891.

Contract for construction of section 4 of Caliente-Kernville road has been awarded to Hooper Bros., Weldon, for $3368.

Rogers & White were low bidders at $8867 for construction of section 6 of Bakersfield-Mojave road.

Contract for construction of section 6 of Bakersfield-Mojave highway has been awarded to Leigh G. Garnsey, 108 West 6th street, Los Angeles, for $13,136.30.

Sacramento—Contract for construction of levees for reclamation district No. 1600 has been awarded to Delta Farm Lands Co., Stockton, for $350,000. Lee A. Phillips, Beverly, Los Angeles, is president of the company. Five dredges will be used on the work.

San Francisco and Vicinity

By F. W. Schumacher

Tommy Robinson, late of Pittsburg, Kansas, who has been furnishing superheated steam for one of the new Giant 225-B Bucyrus shovels, is on a visit to California and is now one of the "Coast Defenders."

Canada

Vancouver and Vicinity

By A. G. Brown

D. A. Graham has been appointed resident engineer at Vancouver for the Canadian Northern Pacific Railway.

E. H. Hamilton has been appointed consulting metallurgist for the Consolidated Mining & Smelting Company at Trail, B. C.

J. C. Breckon, formerly waterworks engineer for the city of Vancouver, B. C., is now associated with the engineering firm of Du Cane, Dutcher & Co., Vancouver.

Fred Ricketts has been appointed road superintendent in the municipality of Esquimalt, B. C., to succed Mr. E. Williams, who is on active service. Mr. Ricketts was formerly in the employ of the provincial government upon similar work.

The extension of the Pacific Great Eastern Railway to Clinton, 47 miles in length, has been completed and put into operation. The P. G. E. has now in operation 166 miles of its line from Howe Sound northwards.

Foley Bros., Welch & Stewart, contractors, report that the progress of the Roger's Pass tunnel for the past year has been 3½ miles of heading and 2 8-10 miles of double-track tunnel enlargement. The heading has now been finished and the progress in tunnel enlargement is averaging somewhat over 50 feet per day.

A decision favoring McIllwee & Sons in their suit for a quarter million dollars damages against Foley, Welch & Stewart, over boring the C. P. R. tunnel at Roger's Pass has been handed down by the Privy Council, which dismissed with costs the appeal of Foley, Welch & Stewart from a judgment of the British Columbia Court of Appeals, awarding McIllwee & Sons the full amount of their claim. The plaintiffs claimed damages for a cancelled contract.

Negotiations are now progressing with reference to the construction of a railroad between Athabasca and Fort Vermilion at an approximate cost of $10,000,000. The project includes the development of mines and a fleet of steamers for the Peace and McKenzie Rivers. Hon. A. B. MacKay, M. P. P., 10619 99th Ave., Edmonton, is interested in the scheme.

The Canadian Pacific Railway Co. has announced that only two miles of track remain to be laid to give the company a continuous line from Nerlson to Vancouver over the Kettle Valley lines. The unfinished trackage lies in the Coquihalla section. The official opening of the new line, which is 300 miles long and connects with the C. P. R. main line about two miles west of Hope, will take place in the spring.

Surveys of the available water power throughout British Columbia show that 3,000,000 H. P. can be developed from the streams of this province, and that only about 8 per cent., or approximately 240,000 H. P., has been made use of up to the present.

British Columbia has produced $73,269,603 of placer gold, $81,595,516 of lode gold, $37,709,282 of silver, $31,468,462 of lead, $86,939,370 of copper, and $149,814,462 of coal and coke; $26,026,050 other metals and building stone, etc., a total production of $486,822,745. The mineral production for 1914 was $26,388,825. Lode mining has only been in progress for about 22 years, and not 30 per cent. of the mineral land has been even prospected; 250,000 square miles of unexplored mineral-bearing land are open for prospecting.

Connecticut

Stonington—Lathrop & Shea, New Haven, Conn., have been awarded contract by New York, New Haven & Hartford Railroad, for extra tracking through here.

Georgia

Elberton—Contract has been awarded Nichols Construction Co., for constructing a line from Tignall to Anthony's Chapel, distance 12 miles, and from Tignall to Washington, distance 13 miles, for Alberton & Eastern Railroad Co., Elberton, Ga.

Illinois

Chicago and Vicinity

By H. E. Scott

The Carter Construction Co. of New York report their work at St. Louis about completed. On Saturday, February 19th, they had an elaborate as well as a very unique banquet given in honor of the Mayor and City Officials of St. Louis. The banquet was held in the tunnel at a depth of 80 feet under the surface.

S. P. Croft and C. F. Wussow of Milwaukee, Wis. are in the city taking in the Cement Show.

C. H. Connors, 406 West Church St., Champaign, Ill. was in the city taking in the Cement Show.

Chas. Stoner of Mendota, Ill. slipped into the city and is taking in the Cement Show.

A. B. Cook of St. Paul, Minn., enroute from Seattle, Wash. to New York City, stopped off a few hours in the city last week. He reports his work progressing favorably with the usual delays as to cold weather.

J. A. Patten of Atlanta, Ill. was a caller last week. Joe is looking fit and says he is looking for anything that comes along.

Gus Norstrom of St. Paul, Minn., was in Chicago for a day. Gus has just returned from a trip to Montana and Washington and says they measure the snow out there as so many men deep.

Peter Meagher of Duluth, Minn., and Pete McVeigh of Great Falls, Mont. have been calling on friends in Chicago. Both of them are looking fine and ready for the "Spring Opening." They took in all the sights as well as the Auto Show.

Tom and Charles Blythe of Tama, Iowa, and Pete Shugart of Nevada, Iowa, were visitors during the Automobile Show.

Paddy McGraw was seen in Chicago one day last week and reported his work as going on as usual.

News from Chicago and Vicinity

By Forrest Fordham

Mr. Blair, formerly of the Blair-Mullen Co., Booneville, Ind., has left the above concern on August 1st, 1915, and is now figuring on some levee work.

W. J. Newman Co. of 19 North Curtis St., Chicago, is getting along nicely on the new Pennsylvania Depot work at Canal and Madison Streets, Chicago, and has just purchased another Bucyrus 18-B special steam shovel.

Fred R. Jones who has two 70-C Bucyrus shovels, one Bucyrus 100-C shovel and one Bucyrus class-14 dragline machine, is progressing very nicely with his work on the Cleveland reservoir.

John Jones of Fostoria, Ohio, and Louis Jones, his brother who lives at Kansas, Ohio, just recently secured another contract for widening the Sandusky River at Tiffin, Ohio, where they are using a Bucyrus 18-B special shovel and a class-7 Bucyrus dragline machine. They report that they are progressing nicely with the work.

F. W. Renwick, vice-president and general manager of the Chicago Gravel Co., and wife left for an extended trip to Florida on February 16th, touching Jacksonville, Palm Beach, Stuart, Miami, Key West and Cuba, and returning visiting with friends at Petersburg, then via boat to New Orleans. Mr. Renwick reports that they had a very successful year in 1915 and that they have many orders booked for this year.

Ed. Renwick, general superintendent of the Chicago Gravel Co., has just returned from an Eastern trip, stopping at Toronto, Ottawa, Montreal, and Quebec, Canada, Boston, New York, Philadelphia and Washington, where he visited several plants and met numerous friends. He looks fine and from the stories he tells he had one good time. He expects to start up their plants early this spring, as they have numerous orders for their material.

Geo. E. Kennedy, 301 Western Ave., Blue Island, Ill., Telephone 573J, called at our office on February 17th with his brother J. W. Kennedy who lives at 4823 North Lawndale Ave., Chicago, Telephone Monticello 4344. J. W. Kennedy has been in the construction business as general superintendent and other positions for a great many years and is very well known among contractors in general. G. E. Kennedy is a first class steam shovel runner. These two gentlemen are now open for positions. They have both had a great deal of experience in all kinds of construction work and are highly spoken of in their line of business.

Robt. Knox who is connected with A. Guthrie & Co., railroad contractors, St. Paul, Minn., and C. H. Caswell, general agent, freight department, Rock Island Railroad, were in the city yesterday. Mr. Knox is negotiating with the Rock Island Road for a spur and side track to be put in to unload material on Section 13 of the Sag Canal.

It is understood here in Chicago that J. C. Dunn and P.F. McCarthy, whose office is at 305 South Dearborn St., have launched into a new business, as they were with Ban Johnson, president of the American League, on February 16th to close a deal whereby they will take over the ownership of the Cleveland Indians. We wish them success in their new venture.

S. E. Elmore, formerly central sales manager of the Bucyrus Co., office 622 McCormick Bldg., Chicago, has accepted the position of superintendent of the Evansville plant of the Bucyrus Co. Mr. Elmore left Chicago on February 10th to enter upon his new duties. We might add that the employees of the Chicago office as well as numerous customers among whom he had made many friends, regret very much his leaving Chicago.

E. C. Hingston, formerly located in San Francisco as sales manager for the Bucyrus Co. at the above place, is to succeed Mr. Elmore as sales manager in the Chicago office. Mr. Hingston arrived in Chicago on February 17th and from this date on will be found at the old stand, 622 McCormick Bldg., where he will be pleased to meet customers and friends of the Bucyrus Co. We also wish Mr. Hingston success.

Chicago—Contract for constructing second track south of Chicago for the Erie Railroad about 35 miles in length has been awarded Robert Grace Construction Co., 409 Electric Bldg., Cleveland, Ohio.

Indiana

LaPorte—Contract for building grade for road and railroad 204 miles long from Miami to Ft. Myers, Fla., 50 miles of which is through Everglades, famous Florida swamps, has been awarded to V. F. Smiths & Sons, LaPorte, Ind.

Kansas

Pittsburg and Vicinity

By W. S. Russell

We are having fine weather for the past two weeks, moderately cool and the roads are drying up so that people who live in the country can get to town, and people who live in town can go to the country. The pigs and chickens can now get out in the fields and scratch for a living as the snow is all gone, which must be a great comfort to the farmers.

The coal market is still brisk with a good demand and the coal mines are beginning to catch up with their orders. Prices remain the same as last month and we quote as follows: Lump per ton, $2.50; Nut per ton, $2.25; Mine run per ton, $2.00; Mill run per ton, $1.70; Slack per ton, $1.40, F. O. B. railroad cars at the mines.

The coal stripping steam shovels are nearly all working, a number of them double shift in order to keep up with their

orders. Some of them are undergoing repairs incident to the extreme bad weather which prevailed in January and February. There is no shortage in the supply of railroad cars which is a great benefit to the coal strippers at this time.

The Roy-Millner Coal Company of Weir City, have installed their 225-B Bucyrus steam shovel at Fuller, Kansas, about 10 miles north of Pittsburg on a field of 150 acres, purchased of the C. H. Markham Coal Company and are ready to commence operations. They are also operating a 150-B Bucyrus shovel on the same field. Also a 150-B Bucyrus shovel near Weir City which they installed over three years ago. A. W. Roy is manager of operations at Fuller, Kansas.

The Besse-Cockrill Coal Company are operating a model-250 Marion steam shovel south of Weir City, on a field of 80 acres. They have a fine vein of coal 3½ feet thick. C. C. Cockrill of Weir City, is manager of field operations.

The Southern Kansas Coal Company of Weir City are operating a 95-ton Vulcan steam shovel stripping coal about a mile south of Scammon. Henry Jenkins is manager of field operations.

The Barton Ridge Coal Company of Liberal, Missouri, have a 225-B Bucyrus steam shovel in operation on a field of 170 acres about 2½ miles southeast of Liberal. The overburden runs from 12 to 24 feet. The coal is 28 inches thick of excellent quality and is free from horsebacks which is quite an advantage in working. C. W. Waterman is manager of operations.

Harry Miller, manager of the Pittsburg-Scammon Coal Company at Scammon, has returned from a trip to Texas where he enjoyed a pleasant vacation of several weeks.

E. P. White of Smith, Scott & White, coal stripping contractors, has returned from a trip to Dallas, Texas, where he is interested in some paving contracts. He says they are having most beautiful weather down there with sunshine every day. That the farmers are plowing their fields and preparing to put in their crops while all nature is looking gay.

W. D. Leonard of Kansas City, representing the Leschen & Sons' Rope Company of St. Louis, spent several days at Pittsburg recently looking after interests of his firm and reports business in his line as being very good.

E. S. Nevius, president of the Nevius Coal Company of Kansas City, spent several days in Pittsburg last month where they also have an office, looking after their business. F. E. Doubleday, of the Doubleday Coal Company of Pittsburg, has charge of the Nevius Coal Mines near Mulberry.

Lee Bigley, superintendent for the Moka Coal Company, at Mulberry, was a visitor at Pittsburg several times last month.

James Hamilton, a coal operator of Weir City, came up to Pittsburg one day last week. He said their business was fine and that they were hardly able to fill their orders.

Pittsburg is beyond doubt the liveliest town in Kansas owing mainly to the prosperous condition of the coal trade. The Kansas field being the best market in the country with good prices. The two leading hotels are well filled and the streets are crowded with people.

There are good opportunities for parties having means to engage in coal stripping in the Kansas field. Strip coal land can be bought or leased at reasonable prices and there is good money in the business. Further information will be furnished by addressing W. S. Russell, Stilwell Hotel, Pittsburg, Kansas.

The Bucyrus Company have a stock of repairs for their coal stripping steam shovels at the W. L. Sullivan Machinery Company store room which is a great convenience t operators of Bucyrus steam shovels.

The W. L. Sullivan Machinery Company are located on 7th street near Broadway where they have a stock of coal miners' mill, railroad and contractors supplies. They are dealers in machinery, engines, boilers, pumps, motors, etc., for either steam, gasoline or electric. Also have repairs for Bucyrus steam shovels. Mr. Sullivan will give his personal attention to the wants of their customers.

Minnesota

Minneapolis—T. G. Hawkins has been serving as a millwright during the winter in Minneapolis, but is at present getting uneasy to hear the shovel's snort once more.

Minneapolis—Contract for constructing 5.75 miles railroad to mine of the Consolidated Cermilion & Extension Co., has been awarded to C. W. Wordenhoff, Minneapolis, Minn.

Mississippi

Leota Landing—C. R. Owens is operating the tower excavator for the H. B. Blanks Levee Co., here. The machine is building levees along the Mississippi River. Our last information from Mr. Owens states that the machine has been held up recently on account of high water.

Missouri

Notes from Little River Drainage District

By J. S. Whitley

J. M. Floesch and several of his colleagues were in town on the 11th on business. They remained several days before returning east.

Mr. Lehman of the Bucyrus Co's. engineering force paid these works a visit recently, also at White Water. He was around looking over the machines trying to find weak points, that they might be remedied in future construction.

W. J. (Tommy) Hawkins, who has been working for the Natomas Consolidated of California for several years, is running a 175-B electric dragline for Floesch Construction Co. He has been on this machine almost a year now. Tommy seems to like Ancel pretty well—No, that isn't her name, that's the name of a town. Don't know her name but engineer Everding described her as very beautiful.

Work here has been closed down for several days owing to the high water in the Mississippi River and heavy local rains, but all machines have resumed work again.

Unusually heavy rains in this district put all streams and rivers out of their banks and flooded practically all the lowlands, consequently closing down all the dragline machines for several days. Long stretches of the Iron Mountain Railroad tracks were washed out, which suspended traffic for a week.

Henry Lilburn of North Yakima, Wash., who was formerly running Bucyrus draglines in Idaho for U. S. Reclamation Service, is running the morning shift on No. 801 (class-24 electric). This machine makes the initial cut and finishes one slope while No. 802 (the Blue Ribbon machine) which is the same size follows up and takes out the balance and completes the cut.

Bill "the Swede"—known to some as Wm. T. Lundquist, is running the morning shift on No. 802 on these works for Floesch Construction Co. Bill often gets "dirt hungry" or what is known to the profession as "dirt movers fever" and in his delirium he says: "John Malone (the pit foreman) its Greenbrier or bust." The said fever was reported at 208° F. once. That's a long story and space is limited, but be it said that six days are inadequate so he quite often goes to "the cape" Saturday night so that he can work on the "big job" over there on Sunday. That doesn't take up all his time though as I've been told. Watch out Bill, this month has 29 days so beware!

WHO BUILDS THE LEVEES—"UNCLE HAPPY"!

Claysville—W. E. Fletcher is operating a 70-C Bucyrus for the Missouri, Kansas & Texas Railway, here. Mr. Fletcher has been with the M. K. & T. for the past twelve years, and with the Union Pacific and the Santa Fe before he came with the first mentioned company.

Kansas City—Contract for constructing a 15 mile line from North Kansas City to Tiffany Springs has been awarded W. E. Winner, 310 Dwight Bldg., Kansas City, Mo.

New Mexico

Santa Bita—The following is a list of shovelmen now employed by the Chino Copper Co., Santa Rito, N. M. Engineers on day shift: E. H. Williamson, H. G. Moses, F. H. Porter, W. H. Smith, Harvey Forsythe, W. E. Smeck, Dan Nolan, Wm. Elmore, Wm. Gallagher and F. W. Rawley. Engineers on night shift: A. H. Jamison, P. A. VanBramer, L. J. Oliver and G. A. Anderson. Cranemen on day shift: B. H. Bristow, A. M. Hancock, E. M. Anderson, A. E. Butcher, J. E. Cottraux, John Watson, Dick Nolan, Chas. Williamson, R. L. Munson and Fred Dunder. Cranesmen on night shift: H. K. Dannettele, Good Sears, F. W. Clark and Gus Gruewell. Firemen on day shift: G. A. Harris, S. A. Cox, R. C. Hall, J. J. Coates, W. W. Stuckey, E. M. Hon, Arthur Holman, E. H. Smith, Robert Byrd, and C. W. Lightsey. Firemen on night shift: H. F. Smith, A. B. Carter, John Thoresen and N. H. Deskins.

New York

New York and Vicinity

By H. Grey

Ray A. Ilg of the Bucyrus Company recently made a record trip from South Milwaukee, Wis. to New York City with twenty-seven carloads of dredging machinery for the Ropp Tin, Ltd., Africa. He brought most of these cars through in three days time which is especially remarkable on account of the congested condition of the railroads at present. The quickest time made between South Milwaukee and New York heretofore has been five days which proves that Mr. Ilg is a hustler.

Al. Geddes is at present running an 18-B shovel for the Otsego & Herkimer Railroad Co. at Cooperstown, N. Y.

J. Albert Kruse is operating an 18-B Bucyrus shovel for the Westinghouse, Church Kerr Co., at Bloomfield, N. J.

Jim McArdle is running a Little Giant Vulcan shovel for Henry H. Wagner in Brooklyn.

New York—Degnon Contracting Co. at about $1,370,000 was low bidder for construction of section 2-A of Route No. 12 of the Rapid Transit System of New York City. Work calls for two track underground railroads in Flatbush Ave., between Prospect Park Plaza and Bright Beach Railroad and Malbon St.

The Coast & Lakes Contracting Co., Inc., at $94,280, was low bidder for installation of track on White Plains road extension of Lenox Ave. branch of subway for New York City.

North Carolina

Hamlet—The Vaughan Construction Co. has been awarded contract for grading for new shops at Hamlet for the Seaboard Air Line Railway. Yorke & Cobb, Raleigh, N. C., have contract for seven large buildings.

Ohio

Cleveland—Tom McClure is firing a 100-C Bucyrus shovel for the Fred R. Jones Contracting Company on the Baldwin Reservoir work, here.

Oregon

Florence—Lee Hurd, a dragline operator, is at present with A. C. W. Berry on a jetty job here.

News from the Northwest

By L. T. Russell Portland

Giebisch & Joplin, have the contract for excavating the basement for the Portland Auditorium building, amounting to about 83,000 cubic yards and are using a Browning dragline on the work.

Frank Rajotte, of Rajotte-Fobert & Winters, was a caller at the Portland office of Bucyrus Company, recently and says he has stored his two shovel outfits at Centralia Washington, until conditions improve somewhat.

It is the expectation of all concerned that work on the Alaskan Railway system will be resumed in the near future.

Robert Sloan of Sloan Bros., Seattle, Washington was the successful bidder on the McLellan Pass highway work, better prices were obtained for this job than for any similar work for the last year.

Charles Farr, of the Wadsworth Brick & Tile Company, Wadsworth, Ohio, was a caller at the Portland office not long ago. Mr. and Mrs. Farr, are spending the winter on the Pacific Coast.

There are rumors of considerable railroad work in the northwest, especially in Oregon and Montana, if some of this is actively started the coming season, it will help out the situation very materially.

In the last month, we have had some of the worst weather in more than twenty years, with rivers frozen over, much snow, sleet, and high cold winds, with all business at a standstill, now however, the average individual is cheering up and hoping its all in the past for this year anyway.

The Suttles Lake Irrigation work has been let to H. J. Kaiser & Company, Victoria, B. C., at cost plus 13½%, the contractor to dispose of the bonds which must be done before work can be started.

J. Harris Johnson, and associates 1021 Yeon Bldg., Portland, Oregon, have started work on the reservoir for the South San Joaquin Irrigation District, with one Vulcan shovel, and expect to add to their plant in the near future.

Virginia

Richmond and Vicinity

By J. G. Skelton

Boxley, Goodwin & Bray have just put their new 70-C Bucyrus to work in a rock cut on Southern Railway double-track work near Elma, Va. Mr. Bray advises that the shovel is doing excellent work.

Washington

Sunnyside—Judd Alexander has just finished a job on a Bucyrus dragline at Granger, Washington, where has has been for the past few months. Judd is now ready for another.

Everett—Contract for the construction of a $600,000 irrigation project for Suttle Lake irrigation district has been awarded to H. J. Kaiser Co., 717 33rd street. Sub-constracts will be awarded on this work as soon as arrangements for financing the work are completed.

West Virginia

The Chesapeake & Ohio has awarded the contract to Board & Duffield, Charleston, W. Va., to build the Pond Fork Railway. The projected route is from a connection with Coal River district

of the Chesapeake & Ohio at Madison in Boone county, West Virginia, southeast up Pond Fork to the mouth of Left Fork of Pond Fork, about 10 miles. The work involves handling about 21,000 cubic yards to the mile. The maximum grade will be 0.5 per cent, and the maximum curvature 12 degrees. There will be three small bridges on the line; the work calls for the construction of about 3,000 cubic yards of concrete for bridges and culverts. The line is being built to carry coal and timber.

Wyoming

News from the North Platte Project

A letter from Ft. Laramie brings the happy news of the arrival of a 6-pound dragline runner in the home of Mr. and Mrs. F. A. Mengel. Mrs. Mengel tells us that he is "some boy," and of course will be a Franklin, Jr. His father was busy passing Tom Moore's around the camp on the big day.

Winston Bros. class-24 Bucyrus has been moving dirt rapidly despite the very severe weather. At the present time he is looking after the machinery in general.

Harry Knowlton is building a store with a drug department, groceries, dry goods, etc. Mrs. Knowlton has recently returned from Denver where she has been making the necessary purchases.

During the month of February, Winston Bros. Co. hauled several car loads of coal from the railroad at Whalen to avoid the high weater in the spring months. They put up temporary bridges across the Platte River for their own use.

We understand that G. L. Payne, superintendent for the Crane Company on their contract on the Ft. Laramie Unit of the North Platte Project, went to Omaha during the holidays and brought back with him, a bride. The happy couple are residing at the Fort.

PROSPECTIVE CONSTRUCTION

Alabama

It is being planned by Louisville & Nashville Railroad Co. W. H Courtney, Louisville, Ky., chief engineer, to doubletrack, its line between Montgomery and Calera, distance 63 miles. Cost about $2,000,000.

It is being contemplated to prepare plans at once for completion of the line from the Mobile & Ohio Railroad at Alabama Port to Cedar Point, distance about 3¾ miles for the Tidewater Securities Corporation, J. M. Dewberry, president, Mobile, Ala.

It is reported that the Illinois Central Ry. will soon take up project for the extension of its line from Haleyville to a connection with the Alabama, Tennessee & Northern at Reform. About 50 miles of new line would have to be built.

Arizona

It is stated that the handling of about $150,000 cubic yards of material will be necessary for repairing levees in Yuma Valley damaged by recent floods.

Arkansas

The following roads will be constructed by the State Highway Department. Dermott toward McGehee, cost about $18,000 McGehee toward Dermott, 4.1 miles, cost $21,500. McGehee toward the west, 3.5 miles, cost $19,564. From Winchester in three directions, 3.6 miles, cost $18,000, and from Louisiana line through Chicot county to Dermott, 43 miles, cost $21,280.

Contracts probably will be let about March 15 for construction of Cotter, Rush & Mineral Belt Ry. Route of line is as follows: From Cotter to Cripple Creek, 3 miles; to Hall Mountain, 7 miles; to Clabler Creek, 12 miles; to Rush Creek, 14 miles. Work will involve about 85,000 cubic yards of earth excavation and about 25,000 cubic yards of rock excavation. There will be one steel bridge about 170 feet in length and 950 feet of piling. There also will be 14 wooden bridges on concrete piers averaging 70 feet in length and 850 feet of trestles. R. P. Sharpe, Cotter, Arkansas, is chief engineer.

California

H. H. Henderson of Anderson, has completed plans for irrigation system for Anderson-Cottonwood irrigation district and work will be advertised soon.

Separate bids will be asked on the following five units: First, headgate and tunnel. This tunnel will be 2400 feet long and 9 feet square. It will be lined with concrete. Second and third, excavation of main canal in two divisions. The canal will be 39 miles long, 46 feet wide, and 6 feet deep. Fourth, excavation of laterals. Fifth, construction of siphons and concrete headgates. One of these siphons is to be under the Sacramento river, 70 feet long, 36 inches diameter, and will be made of cast-iron.

Bids will be received until March 7th by county clerk San Rafael, for improvement of road from Willow Camp to head of Bolinas Bay.

An expenditure of $100,000 on harbor improvements is proposed for Crescent City. Edward G. Hersch is interested.

The Southern Pacific Co. plans a railroad from Eureka, Cal., to Coos Bay, Ore., 260 miles. William Hood, San Francisco, is chief engineer.

Surveys have been completed for a state highway from Rumsey to Lower Lake, 35 miles. Estimated cost is $100,000.

F. C. Finkle, I. W. Hellman Bldg., Los Angeles, is preparin plans for the construction of 3500 feet of levees along Mojave River near Victorville, to protect the plant of the Southwestern Portland Cement Company.

Idaho

Paving about 20 blocks to cost about $100,000 is being proposed by the City of Blackfoot. City clerk will furnish further information regarding this work.

Illinois

Bids for constructing concrete or brick roads will be received by John R. Moors, county clerk, Danville, until March 14, 15 and 16.

Indiana

Surveys for a line from Indianapolis to Frankfort, Ind., distance 43 miles, have been completed for Pennsylvania Railroad, A. C. Shand, chief engineer, Philadelphia, Penn.

Bids will be received until 3 P. M., March 23, by Jacob F. Spiker, constructing commissioner, Noble block, Vincennes, for construction of William H. Brevoort et al, levee system. System will consist of 21 miles along Wabash River, 10 miles along White River, and 6 miles along river Dushee and Plass Ditch, requiring 1,684,350 cubic yards of earth work, 44 reinforced concrete and cast iron pipe sewers with sludge gates, moving ten buildings and furnishing and driving 25,000 feet of sheet piling.

The Pennsylvania Railroad is understood to be working on plans for the construction of a proposed new line between Ben Davis and Frankfort. This line would be about 41 miles long and would cost nearly $100,000 per mile. It would connect Ben Davis on the Vandalia railroad and Frankfort on the Michigan division of the Vandalia. A considerable portion of the right of way already has been secured.

Kansas

Construction of 8 miles of macadam road between Fort Scott and Redfield is being proposed. N. J. Rose is county clerk.

It is being contemplated by the Kansas City, Mexico & Orient Railroad to let contract soon for extension of its line from Wichita to Turner.

A road which will be known as the Garden City, Hastings & Orient Railway Co., Garden City, Kansas, has been incorporated to build railroad from Garden City to Stockton, about 225 miles.

L. A. Wells Construction Co., 34 Wade Bldg., Cleveland, Ohio, is ready to receive figures on approximately 250,000 cubic yards of grading for construction of 23 miles of electric railway from Fort Scott, Kansas, to Mulberry, Kansas. Work is to start as soon as weather will permit.

Kentucky

Surveys, plans and estimates have been finished for 8 miles of gravel road in Union County—Morganfield to Boxville Road. Contracts will be let this spring. Norman R. Orcutt is engineer.

Mississippi

The Meridian & Memphis Railroad will build a line from Union to Sebastapol, about 13 miles. S. A. Neville, Meridian, is vice-president.

Montana

An election will be held March 4th to vote on a bond issue of $175,000 for the construction of a county highway system, 47 miles in all.

It is being planned by the Northern Pacific Railway Co., W. L. Darlington, St. Paul, Minn., chief engineer, to extend lines from Helena through the state.

Sealed proposals will be received at the office of the United States Reclamation Service, Malta, Mont., until March 15, 1916, for earthwork and structures, Bowdoin Canal, Milk River project. Further information may be obtained on application to the United States Reclamation Service, Washington, D. C., Denver, Colo., or Malta, Mont.

North Dakota

The Northern Pacific Railway Company, W. L. Darling, chief engineer, St. Paul, Minn., will extend its present line from Mott, N. D., from 44 to 50 miles.

New York

It is being contemplated by the town of Arcadia to construct a 4 mile highway from the New York Central tracks in Newark to Fairville. Town clerk, rural delivery, Newark, will furnish further information regarding this work.

Oregon

E. G. Hopson, Central Bldg., Portland, has prepared plans for the proposed Five Mile Rapids irrigation project near Pasco, Wash. Estimated cost is $3,000,000. The project will contain 70,000 acres.

Texas

The Missouri, Kansas & Texas Ry., Dallas, has appropriated $10,000,000 for improving its lines in the state during the next three years. L. F. Lonnbladh, is chief engineer.

Virginia

It has been decided by the New York, Philadelphia & Norfolk Railroad, S. Porcher, Philadelphia, Penn., purchasing agent, to double-track its line from Parksley to Falsley, distance 6 miles.

Washington

It is being contemplated by the Pierce county to construct 5.56 miles mountain road, ¾ mile Helmold-Bowman Road and 2.12 miles Pacific Highway south of Dupont.

It is being planned by county commissioners, M. Weatherbee, county auditor Everett, to construct permanent highways. This will include about 45 miles road paved; 45 miles regraded and made ready for surfacing during 1917, also short stretch north from Edmonds built on new roadway leading north toward Mukilteo.

It is being planned by the Oregon-Washington Railway & Navigation Co., Portland, Ore., to reconstruct its North River line south from Cosmopolis, distance 14 miles.

Plans have been prepared at Tacoma, for the expenditure of $141,898 for permanent highways during coming year.

There is $1,000,000 available for state highway work during 1916. Contracts for $140,000 worth of work have already been awarded.

A bond issue for the construction of additional canals in the Highland irrigation district, Sequim, has been voted.

An irrigation project covering 73,500 acres near Pasco, is proposed. The project includes 40 feet dam on Snake River, pumping plants, and gravity canals. Estimated cost is $4,000,000. A. J. Elrod, is interested.

Plans have been prepared by Thomas Watson, 410 Globe Block, Seattle, for irrgation system for Happy Valley irrigation district, Sequim. There will be 19 miles of main ditch and a siphon 5200 feet long with a maximum head of 625 feet. Estimated cost of system is $100,000. Otto Sindars is president of district. Work will be advertised in March.

Wisconsin

It is being planned by the Chicago, Milwaukee & St. Paul Railway Co., Chicago, Ill., to construct extension of its northern division from Berlin north to Grand Rapids.

The Chicago, St. Paul, Minneapolis & Omaha Ry. probably will let contracts about the middle of March for 6 miles of new track from Norma to Jim Falls, Wis. Work will involve about 150,000 cubic yards of earth excavation and 150,000 cubic yards of embankment. There also will be about eight spans of 100 feet each, deck plate girders on concrete piers. Work will include 6,000 cubic yards of masonry. H. Rettinghouse, St. Paul, Minn., is engineer in charge.

Preliminary arrangements are being made to start work in spring on electric railway connecting Milwaukee, Sussex, Pewaukee, Waukesha, Neosho, Hustisford, Juneau, Beaver Dam and Fox Lake. Alvin P. Kletzsch, Milwaukee, interested.

Wyoming

Bids will be received until 2 P. M., March 10, at the office of the U. S. Reclamation Service for earthwork on 5½ miles of main canal, Fort Laramie Unit, North Platte project. Work includes 811,000 cubic yards excavation. Work is near the Bridgeport-Guernsey line of the Chicago, Burlington & Quincy Railroad. Particulars may be obtained from U. S. Reclamation Service, Washington, D. C., Denver, Colorado, or Fort Laramie.

Bids will also be received until the same time for building structures on about ten miles of Fort Laramie canal on the above project. Work includes 15,000 cubic yards excavation and 3,500 cubic yards concrete.

Western Dump Cars

give the utmost facility in contract hauling because of their correct design and rugged construction. Built in sizes to meet every requirement. The side dumping principle positively insures against stalling on the dump and the consequent digging out or derailment, and permits of greater ease in effecting the dumping operation. Built to withstand hard usage, Western dump cars afford long and efficient service at an extremely low cost of maintenance.

All sizes, ranging from 1½ to 30 cu. yd. capacities, usually carried in stock ready for immediate shipment. Write for complete catalogue which describes Western Dump Cars in detail.

Western Wheeled Scraper Co.

AURORA, ILLINOIS

Earth and Stone Handling Machinery

TRADE NOTES

The Hayden-Corbett Chain Company announce that during the past month, they have been receiving a large volume of business including an exceptionally large number of steam shovel hoisting chain, one order being for ten chains. They stated that the outlook for this year is extremely good, but suggest to all customers that it would be well to anticipate their wants as much as possible with a view of avoiding disappointments in regard to delivery.

The Columbus Chain Company of Columbus, Ohio report that just recently they have been receiving some large orders from different of the railroad companies for their "Hercules Solid Weld" steam shovel chain. These orders came from railroads who had already made a trial of this chain. As the purchasing agents could have bought other steam shovel chain for very much less money, it is pointed out by the Columbus Chain Company that they are fully satisfied regarding quality and service which are the predominent features in their "Hercules Solid Weld" steam shovel chain.

The Herrmann Engineering Co., Detroit, has recently been reorganized, and will be known in the future as the Carson Motor Co.

Two years ago the Hermann Engineering Co. began to put on the market a 4-cycle marine motor, which is now commonly known as the Popular Aristocrat, and is in great demand.

The new officers of the company are: Thos. D. Knight, retired attorney and capitalist of Chicago, president; F. T. Ranney, real estate dealer of Detroit, treasurer; Duerson Knight, assistant treasurer and Secretary, and Alfred Gibbins has been retained as factory manager and secretary.

"OLD RELIABLE" "XX" SHOVEL CHAIN

Some manufacturers make several grades of so-called Shovel Chain.

We make one grade, the

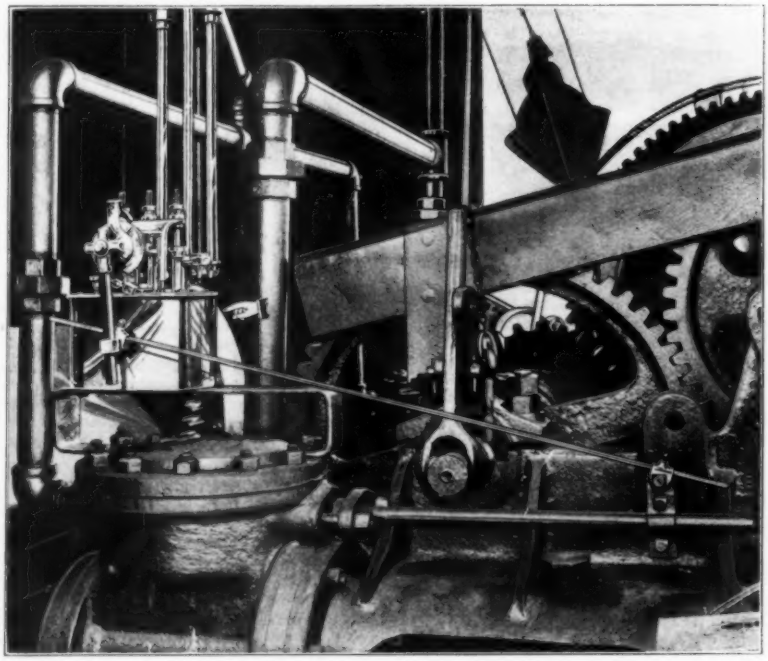
"OLD RELIABLE" "XX" — Our Motto is "QUALITY FIRST"

You may buy some cheaper grades of Shovel Chain than "XX" but our High Grade "XX" Chain is always cheaper in the end. ***Send for catalogue and prices.***

Made only by THE HAYDEN-CORBETT CHAIN CO., Columbus, Ohio

FORCE FEED
Lubricating Pumps

are operating on every description of cylinders.



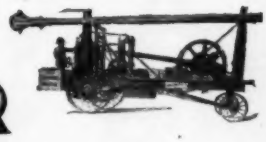
They may be had in any number of Feeds and Compartments with Heaters, without any extra charge.

Hills-McCanna Company

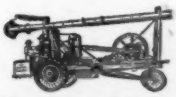
153 W. Kinzie St. **Chicago, Ill.**

For convenience in making inquiry use postal inserted in this number.

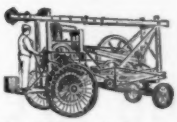
THE CLIPPER



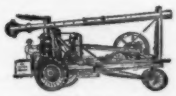
Steam and Gasoline Power



The "Clipper" Steam Traction—Made in many sizes.



The "Clipper" Gasoline Traction—Make in many sizes.



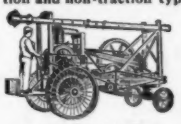
THE "CLIPPER" STEAM TRACTION

Blast Hole Drills

Blast Hole Drills Come
Blast Hole Drills Go
But the "CLIPPER"
Blast Hole Drill

With the record for fast drilling, least repair expense and greatest durability is looked upon as the standard machine and is adopted by the leading Quarry people and Railroad Contractors of the country.

The "CLIPPER" is made for steam, gasoline, compressed air or electric power, and in both traction and non-traction types.



THE "CLIPPER" GASOLINE TRACTIGN

Made only by

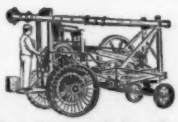
Loomis Machine Co.

P. O. Box B

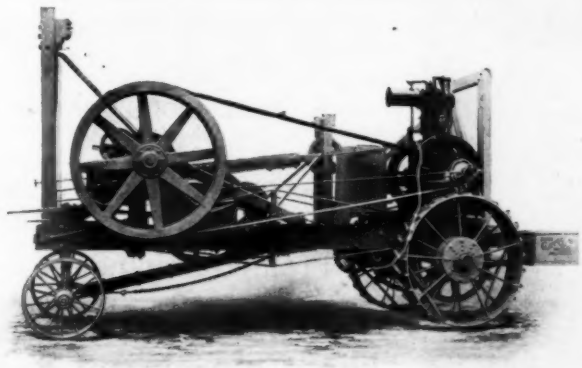
TIFFIN, OHIO

Electric and Air Power

The "Clipper" Steam Traction—Made in many sizes.

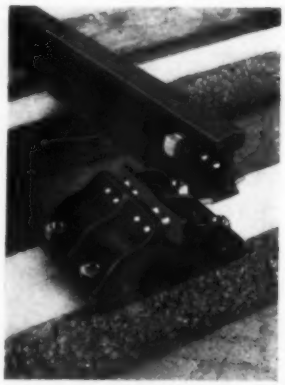


The "Clipper" Gasoline Traction—Made in many sizes.



The "CLIPPER" Gasoline Power Traction Drill.

For convenience in making inquiry use postal inserted in this number.



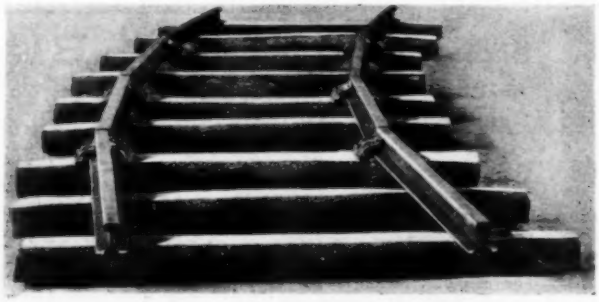
Note curved inner surfaces.

Write for Bulletin No. S-155.
Use postal card enclosed.

BUCYRUS COMPANY
Specialty Dept.
P. O. Box S
South Milwaukee, Wis.

The New Bucyrus Rail Chair

Makes a smooth, sure joint on straight track or on a curve.



A curve with rail ends properly matched and rigidly held in place.

"Hercules Solid Weld" Steam Shovel Chain

For heavy lifting and continued service.

A marvelous chain for Stone Quarry work.

Recommended by leading contractors. Ask for Booklet.

Prompt Shipments.
Reasonable prices.

The Columbus Chain Company
Lebanon, Pa. **Columbus, Ohio**

Address all communications to Columbus, O.

For convenience in making inquiry use postal inserted in this number.

HAYWARD BUCKETS

For Profitable Sewer Construction

THE illustration shows a Hayward Orange Peel Bucket working between sheet steel piling. This is one of many sewer contracts done by the same contractor, and invariably Hayward Buckets were used. They dug and handled practically all the material encountered, whether it was hard rock-filled dirt, clay, rocks or boulders. They have been found to save hundreds of dollars over hand labor methods in this class of work.

Hayward Buckets bring bigger profits in sewer construction.

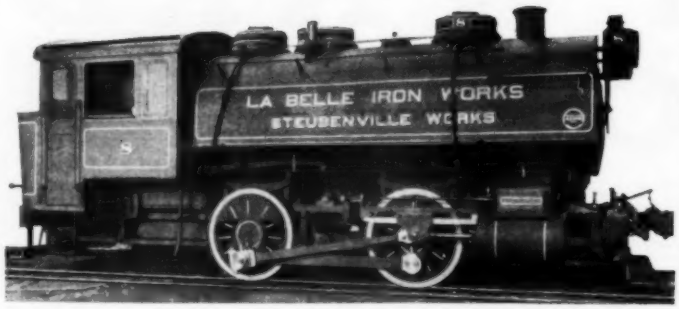
Write for a set of our pamphlets and catalogues.

THE HAYWARD COMPANY

Builders of Digging Machinery

50 Church St. **NEW YORK, U. S. A.**

A STURDY LOCOMOTIVE



Built for La Belle Iron Works

Four-coupled tank locomotives are extensively used in contractors' and industrial service. The illustration shows a standard gauge engine of this type, which was designed with a height limit of 11 feet 6 inches and a width limit of 9 feet 4 inches. This locomotive weighs, loaded, 102800 pounds and exerts a tractive force of 21300 pounds. It is equipped with a Baldwin steam brake and M. C. B. automatic couplers.

With all the weight on driving-wheels, locomotives of this type can haul a maximum load in proportion to their size. They are compact in design, and can be built to pass through restricted clearance limits.

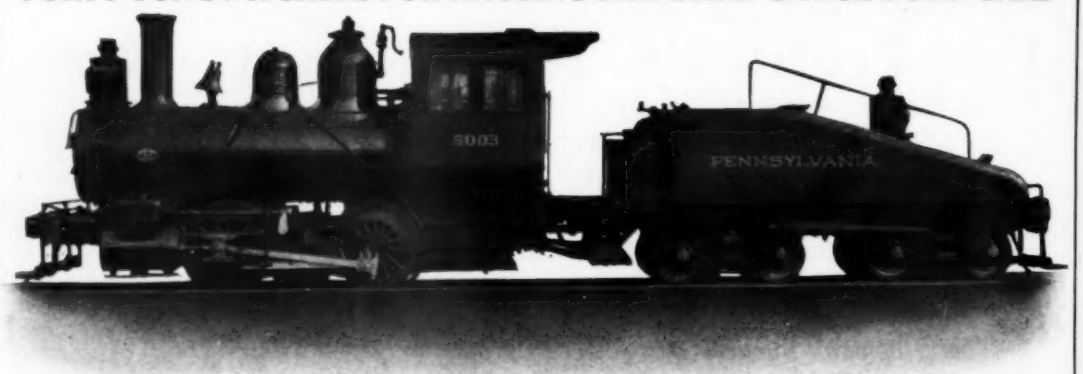
The Baldwin Locomotive Works

PHILADELPHIA, PA., U. S. A.

REPRESENTED BY

F. W. WESTON, 50 Church Street, NEW YORK, N. Y. G. F. JONES, 407 Travelers Building, RICHMOND, VA.
CHARLES RIDDELL, 628 Railway Exchange, CHICAGO, ILL. C. H. PETERSON, 1210 Boatmen's Bank Building, ST. LOUIS, MO.
A. WM. HINGER, 722 Spalding Building, PORTLAND, OREGON

FORTY TON SWITCHERS FOR HAULING STANDARD GAUGE DUMP CARS



BUILT AND OVERHAULED BY THE PENNSYLVANIA RAILROAD IN THEIR OWN SHOPS.
WE CARRY THEM IN STOCK FOR PROMPT SHIPMENT.
THEY ARE PARTICULARLY ADAPTED FOR CONTRACTORS SERVICE BECAUSE THEY CARRY THEIR WEIGHT LOW AND DO NOT OVERTURN EASILY.
HAVE SHORT WHEELBASE FOR SHARP CURVES.
HAVE LARGE FUEL AND WATER CAPACITY.

GENERAL EQUIPMENT COMPANY

H. W. Oliver Bldg., Pittsburgh, Pa.
Virginia Railway & Power Bldg., Richmond, Va.
Commercial Trust Building, Philadelphia, Pa.

30 Church St., New York City

ROEBLING WIRE ROPE

Standard for

Mining, Logging, Excavating, Oil Wells, Transmission of Power, Incline Haulage, Elevators, Construction and All Other Uses

JOHN A. ROEBLING'S SONS CO.

165 West Lake St. CHICAGO, ILL.

Mills: Trenton, N. J.; Roebling, N. J.

Portable Power

WHEN you have need of a small, light, portable motor that you can attach to any kind of a boat in a few minutes, and that has a surprising amount of power for its size, remember that

EVINRUDE

DETACHABLE ROWBOAT & CANOE MOTORS

are being used by many engineers and contractors in many different applications. The Evinrude is known as "The Motor of Universal Adaptability". It adapts itself to almost any conditions under which it is called upon to do its work.

The new Evinrude Catalog—just off the press—describes and illustrates many interesting applications Write for a copy—or mail the coupon.

EVINRUDE MOTOR CO.

438 Evinrude Block, MILWAUKEE, WIS., U. S. A.

DISTRIBUTING BRANCHES:

69 Cortlandt St., New York, N. Y. 214 State St., Boston, Mass.
436 Market St., San Francisco, Cal. Front & Morrison Sts., Portland, Ore.

Over 60,000 Sold

EVINRUDE MOTOR CO., Wis.
438 Evinrude Block, Milwaukee,
Please send me the 1916 Evinrude Catalog

Name.....

Address.....

City.....

For convenience in making inquiry use postal inserted in this number.

New York Belting & Packing Co.

MANUFACTURERS OF HIGH-GRADE MECHANICAL RUBBER GOODS

CONVEYOR BELTING—Our "Indestructible" brand is characteristic of its name—A perfect belt with reinforced cover guaranteed to prove ECONOMICAL and EFFICIENT.

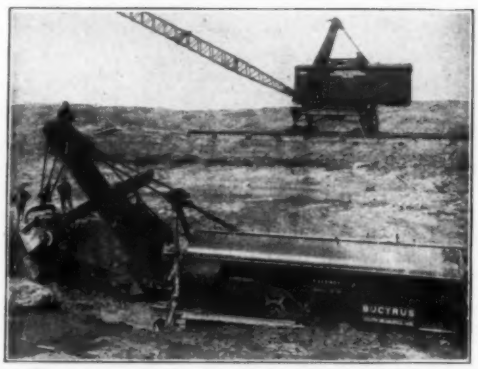
DREDGING SLEEVES—We are PIONEERS and LEADERS in the manufacture of RUBBER DREDGING SLEEVES. Used for government work on the Mississippi River, Atlantic Coast, Philippine Islands and elsewhere. Made in any size, length, or number of plies.

PACKING—Manufactured for all conditions of service. High or low pressure, Steam, Hot or Cold Water, Oil, Grease, Ammonia, Etc.

HOSE—Best ever made for Steam, Water, Suction, Gasoline, Air, Etc.

NEW YORK, N. Y.	91-93 Chambers St.	ST. LOUIS, MO.	218-220 Chestnut St.
CHICAGO, ILL.	124-126 W. Lake St.	PITTSBURGH, PA.	420 First Ave.
SAN FRANCISCO, CAL.	519 Mission St.	PHILADELPHIA, PA.	821-823 Arch St.
SPOKANE, WASH.	157 So. Monroe St.	BOSTON, MASS.	65 Pearl St.

The Digging of the Calumet-Sag Channel



Jas. O. Heyworth's Bucyrus Electric Shovel and Dragline Excavator on Section 11 Calumet-Sag Channel

Sizes Carried in Stock

7/8"-1"-1 1/8"-1 1/4"-1 3/8"-1 1/2"-1 5/8"

Requires a Chain that will stand the Strain

TAYLOR MESABA

Is being relied upon for much of the hardest digging—

Here is what Jas. O. Heyworth writes.

"I am using your "Mesabe" chain on the Model "76" Marion Shovel and on the 70-C Bucyrus Shovel and same is giving satisfaction."

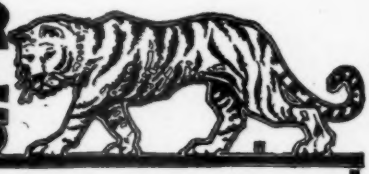
James O. Heyworth, by O. E. Strehlow.

S. G. Taylor Chain Co.

641 Marquette Bldg. Chicago, Ill.

For convenience in making inquiry use postal inserted in this number.

TIGER STEEL BUNKS



Give Your Men Clean, Comfortable Beds to sleep in and they will do better work.

"Tiger" Steel Bunks are of durable and sanitary construction. Frames are steel, coated with rust-proof enamel. The wire link fabric springs are attached to the frame with oil tempered helical springs which assure elasticity and are guaranteed against sagging. Easily knocked down for shipping. Require very little space. Made in single or double decks in a wide range of sizes.

WRITE FOR PARTICULARS AND PRICES

Haggard & Marcusson Co.

1113 W. 37th Street CHICAGO

Dredge Bucket Guide welded with thermit owned by Fitzsimmons Dredge & Dock Co., Chicago, Ill.

General Repairs Made with Thermit

The variety of repairs made possible by the Thermit Process is practically unlimited and the savings which can be effected will often run into hundreds of dollars for just one weld.

Contractors operating on a large scale will be surprised to learn how many broken castings usually consigned to the scrap pile can be saved by means of Thermit. The process not only saves the purchase of spare parts but returns the broken part to service with scarcely any loss of time.

We supply complete welding outfits and give full instruction for doing the work.

Write for our pamphlet No. 2972.

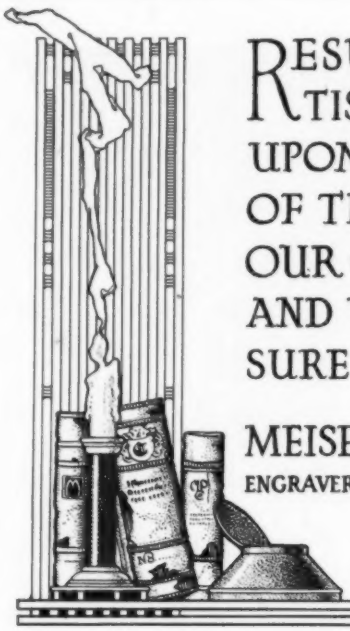
Goldschmidt Thermit Company

WILLIAM C. CUNTZ, Gen. Mgr.

90 WEST STREET, NEW YORK

329-333 Folsom St., San Francisco 7350 South Chicago Ave., Chicago
193 Richmond Street W. Toronto, Ont.

For convenience in making inquiry use postal inserted in this number.



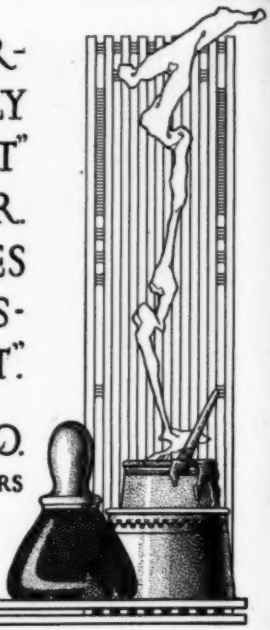
RESULTS FROM ADVERTISING DEPEND LARGELY UPON "PROPER TREATMENT" OF THE PRINTED MATTER. OUR COMPLETE FACILITIES AND WIDE EXPERIENCE ASSURE "PROPER TREATMENT".

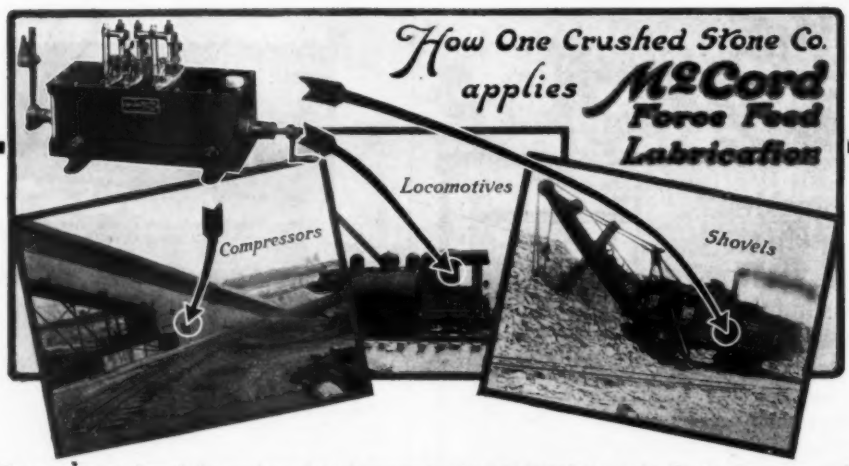
MEISENHEIMER PRINTING CO.

ENGRAVERS · PRINTERS · LITHOGRAPHERS · BINDERS

330 · CLINTON · ST.

MILWAUKEE · WIS.





SOME two years ago through the purchase of an air compressor the Superintendent of the France Company of Middlepoint, Ohio, had his first experience with a McCord Force Feed Lubricator.

After several months' operation, in which the McCord Lubricator showed a saving of 25% to 40% of oil plus other advantages of an unusual nature, it was decided to extend the use of the McCord Lubricator to three large shovels.

Following repeated expressions of preference for the

"McCord" *Force Feed* Lubricator

from the Shovel Engineers over any other lubricating device they had ever used, a McCord was applied to one of their locomotives.

So satisfactory has been the performance of the McCord Lubricator on the equipment to date that it is the intention of this concern to install McCord Type "BA" Lubricators on all of their shovels and locomotives. **Write For Catalog "Y".**

McCORD MANUFACTURING CO. 2587-2629 GRAND BLVD., EAST **Detroit, Michigan**

398

For convenience in making inquiry use postal inserted in this number.

621.86
9Ex2

The Excavating Engineer

Volume 12 APRIL, 1916 Number 7

25 Tons a Minute

The Bucyrus Dredge "Cascadas", the Record Holder, Keeping the Scows Busy.
This is One of Three 15-Yd. Bucyrus Dipper Dredges Slamming Away at the Slides.

THIS IS WHAT ONE 15-YARD
BUCYRUS DIPPER DREDGE
DID ON THE PANAMA CANAL, FRIDAY, FEB. 18th, 1916

according to the "Canal Record" of February 23rd, 1916.

HERE ARE SOME WORLD'S RECORDS IT HAS SMASHED:—
23,305 cubic yards in 23 hours & 15 minutes, hard material. This is nearly equal in weight to three 1st line battleships. Average =over 1002 cubic yards per hour or 25 tons per minute. In the 29 days of February it dug 330,605 cubic yards of rock and earth.

THESE OUTPUTS HAVE NEVER BEEN EQUALLED BY ANY EXCAVATING MACHINE

Send for Dipper Dredge Catalogue

BUCYRUS COMPANY, P.O. Box S, South Milwaukee, Wis.

DISTRICT OFFICES:

NEW YORK CHICAGO NEW ORLEANS SAN FRANCISCO PORTLAND

REPRESENTATIVES:

DENVER . . . . . H. N. Steinbarger
COLUMBUS . . . . . Sykes & Coffin
WESTERN CANADA Dominion Equipment & Supply Co., Winnipeg
EASTERN CANADA . . . . . Canadian Equipment Co., Montreal
PARIS . . . . . Hart O. Berg
CITY OF MEXICO . . . . . Railway Supply Co. S. A.
LONDON . . . . . Geo. P. Wust & Co.
CHRISTIANA, NORWAY . . . . . Fay & Brinck
STOCKHOLM, SWEDEN . . . . Aktiebolaget Jarnvagsmateriel
NEW ZEALAND . . . . . D. K. Blair & Co., Wellington
PETROGRAD, RUSSIA . . International Engineering & Trading Co.
AUSTRALIA . . . . . William Adams & Co., Ltd.
Sydney, Perth, Melbourne, Brisbane.
CHILE . . . . . DuPont Nitrate Co., Wilmington, Del.
JAPAN and CHINA . . . . . Mitsui & Co., Ltd., Tokyo, Japan

For convenience in making inquiry use postal inserted in this number.